

# Developing a Framework for Use of Evidence From Emerging Neurotechnologies – A Way Forward: THE ABIDING CHALLENGE OF TRANSLATING SCIENTIFIC CONCEPTS INTO LEGAL CONSTRUCTIONS (AND VICE VERSA)

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# The Problem of *Translating* Scientific-Research for Legal Decision Making

- Three Basic Issues to Consider
  - G2i
  - Operationally defining legal/normative concepts into scientifically measurable terms.
  - “Muddling Through” – Presenting scientific research in court: using probabilities rather than qualitative-categorical substitutes.
    - The need to systematically examine the law’s reception of science.

# The Inherent Challenges of G2i

*i.e.*, reasoning from group data in science  
to individual decision making in the law

# The Nature of Science/The Needs of the Law

- “While science attempts to discover the universals hiding among the particulars, trial courts attempt to discover the particulars hiding among the universals.”

» DAVID L. FAIGMAN, LEGAL ALCHEMY 69 (1999).

# *G2i*

- Empirical Frameworks (a.k.a. “social frameworks”\*) (a.k.a. “general causation”)
  - Does the general phenomenon of interest exist?
    - Repressed Memories?
    - Battered Woman Syndrome?
    - Psychopathy?
    - Is Bendectin a Teratogen?
  - Is the particular case **an instance of the general phenomenon?** (a.k.a. “diagnostic”\*\*) (a.k.a. “specific causation”)
    - Was the plaintiff’s memory repressed?
    - Does the defendant “suffer” from the Battered Woman Syndrome?
    - Is the defendant a “psychopath”?
    - Were the plaintiff’s birth defects caused by Bendectin?

\*Laurens Walker & John Monahan, *Social Frameworks: A New Use of Social Science in Law*, 73 VA. L. REV. 559 (1987)

\*\*David L. Faigman, John Monahan, & Christopher Slobogin, *Group to Individual Inference (G2i) in Scientific Expert Testimony*, 81 U. CHI. L. REV. 417 (2014)

# People with Leukemia

**Idiopathic**  
80% of all cases

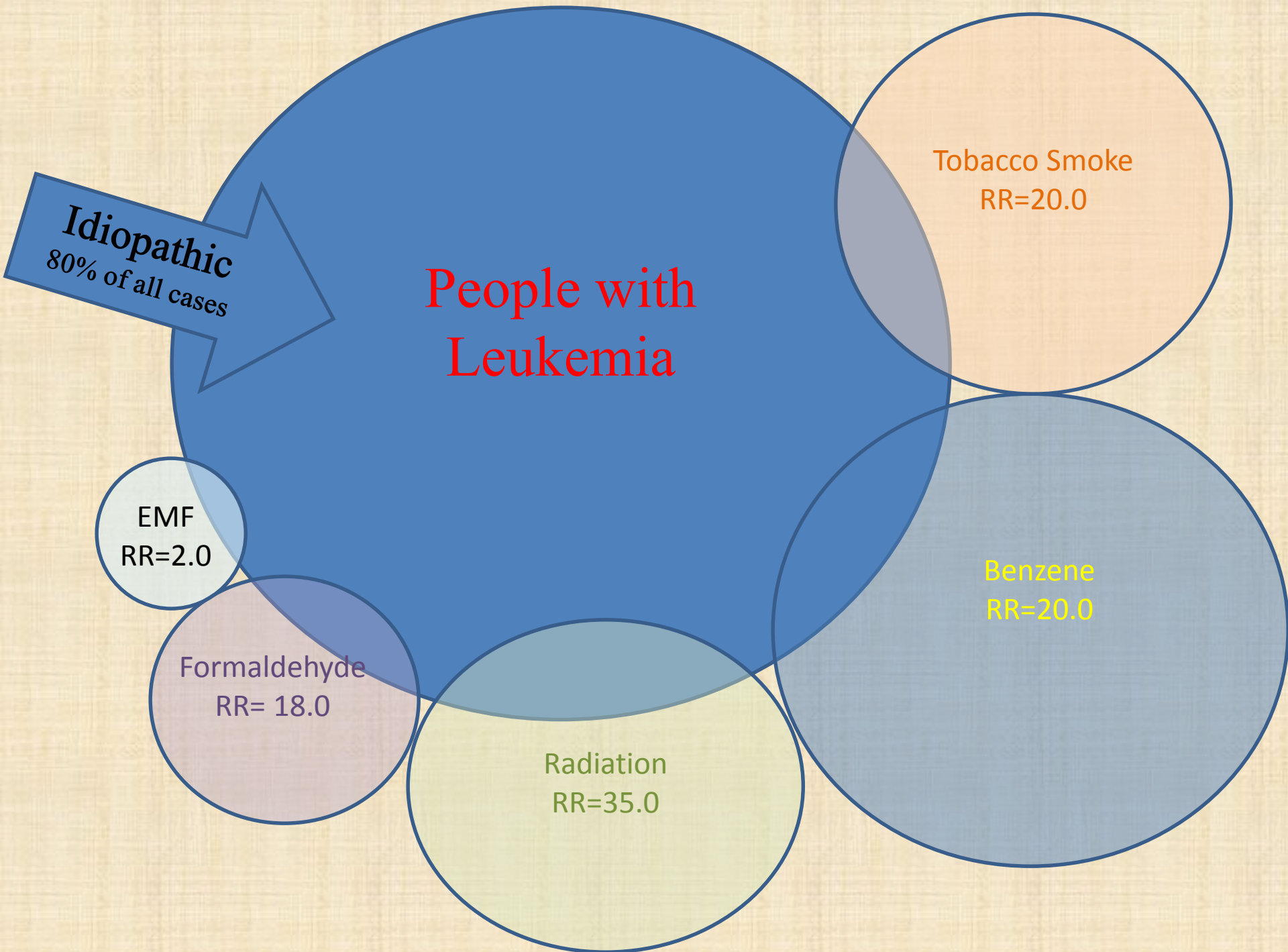
Tobacco Smoke  
RR=20.0

Benzene  
RR=20.0

Radiation  
RR=35.0

Formaldehyde  
RR= 18.0

EMF  
RR=2.0



The Inherent Scientific and  
Legal Challenges of

*OPERATIONAL  
DEFINITIONS*

# Operational Definition -- defined

- **Herbert Feigl put it nicely:**
  - *“To put it briefly, if crudely, operational analysis is to enable us to decide whether a given term in the way it is used, has a ‘cash value,’ i.e., factual reference. If it does have factual reference, operational analysis is to show us precisely what that factual reference is, in terms, ultimately, of the data of direct observation.*
  - Even briefer, “operational definitions are the “link[s] between the empirical (or descriptive) terms of our scientific language and the data of our experience.”



## *E.g.*, Defining “Competency” in the Law

- Competency to receive a sentence of life without parole (*Graham v. Florida*, *Miller v. Alabama*)
- Competency to consent to mental hospitalization (*Parham v. JR*)
- Competency to make an abortion decision
- Competency to waive Miranda rights
- Competency to be executed (*Roper v. Simmons*, *Atkins v. Virginia*, *Hall v. Florida*, *Moore v. Texas*)
  - *The problem of operationally defining “Intellectual Disability” under the Eighth Amendment*

DEFINING  
*INTELLECTUAL  
DISABILITY*

*for legal use under the Eighth Amendment....*

Retribution

Deterrence

# “Intellectual Disability”

- *Atkins v. Virginia*, 536 U.S. 304 (2002).
  - The Constitution “restrict [s] ... the State's power to take the life of” any intellectually disabled individual. But the Court left to the States “the task of developing appropriate ways to enforce” the restriction on executing the intellectually disabled.
- *Hall v. Florida*, 134 S. Ct. 1986 (2014).
  - “[A] State cannot refuse to entertain other evidence of intellectual disability when a defendant has an IQ score above 70....”
- *Moore v. Texas*, 137 S. Ct. 1039 (2017).
  - “Even if “the views of medical experts” do not “dictate” a court's intellectual-disability determination, ... the determination must be “informed by the medical community's diagnostic framework.” (Quoting *Hall v. Florida*)

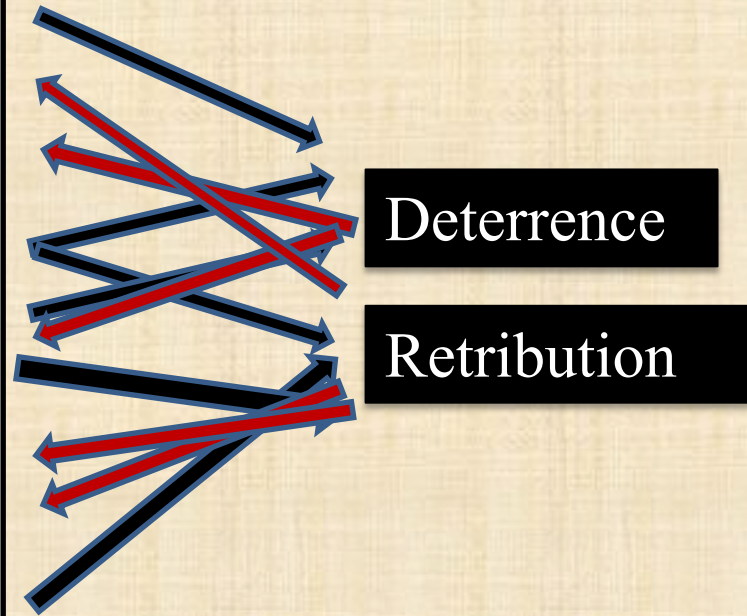
# What is the “Fit” Between Clinical Judgments of “Intellectual Disability” and Eighth Amendment Concerns with Deterrence and Retribution?

- “[T]he Court binds Eighth Amendment law to definitions of intellectual disability that are promulgated for use in making a variety of decisions that are quite different from the decision whether the imposition of a death sentence in a particular case would serve a valid penological end. In a death-penalty case, intellectual functioning is important because of its correlation with the ability to understand the gravity of the crime and the purpose of the penalty, as well as the ability to resist a momentary impulse or the influence of others. By contrast, in determining eligibility for social services, adaptive functioning may be much more important.”

– *Hall v. Florida*, Alito, J., dissenting.

# The Problem of “FIT”

- Significantly sub average intellectual functioning;
- Deficits in adaptive functioning (the inability to learn basic skills and adjust behavior to changing circumstances;
- Onset of these deficits during the developmental period.



**This area is profoundly under-theorized!**

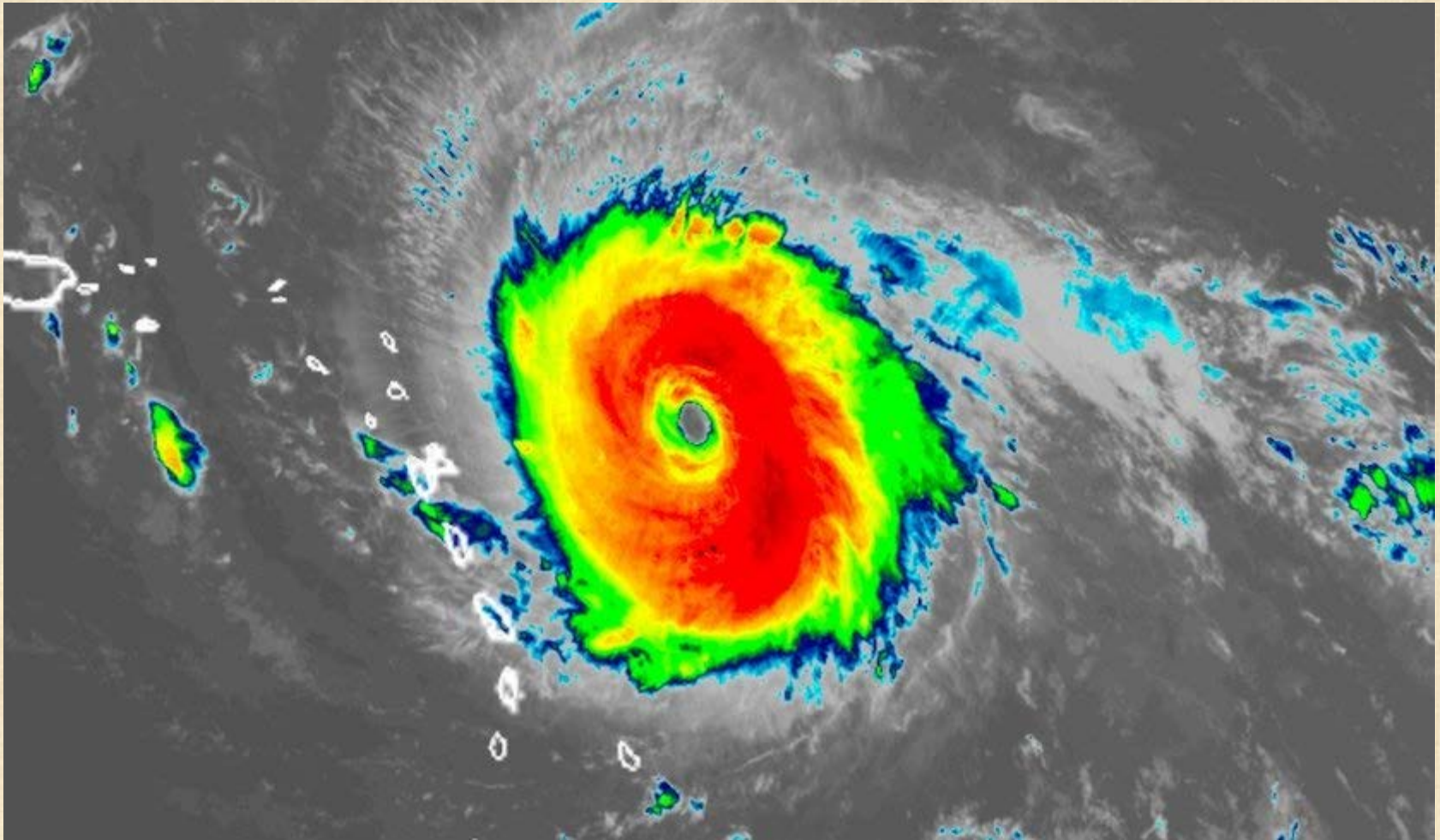
# Lingua Franca versus *What?*

- Should science and the law seek a common language/understanding/definition of terms, or continue to translate from one to the other?
  - Evidentiary Reliability versus Scientific Validity (e.g., *Daubert*)
  - Insanity versus Mental Illness (e.g., The *Durham* Test)
  - Volitional Control versus Delayed-Reward Discounting
  - Intellectual Disability versus “Intellectual Disability”

*muddling through....*

The Inherent Scientific and Legal  
Challenges of

***PRESENTING  
STATISTICAL/PROBABILISTIC  
INFORMATION IN COURT***



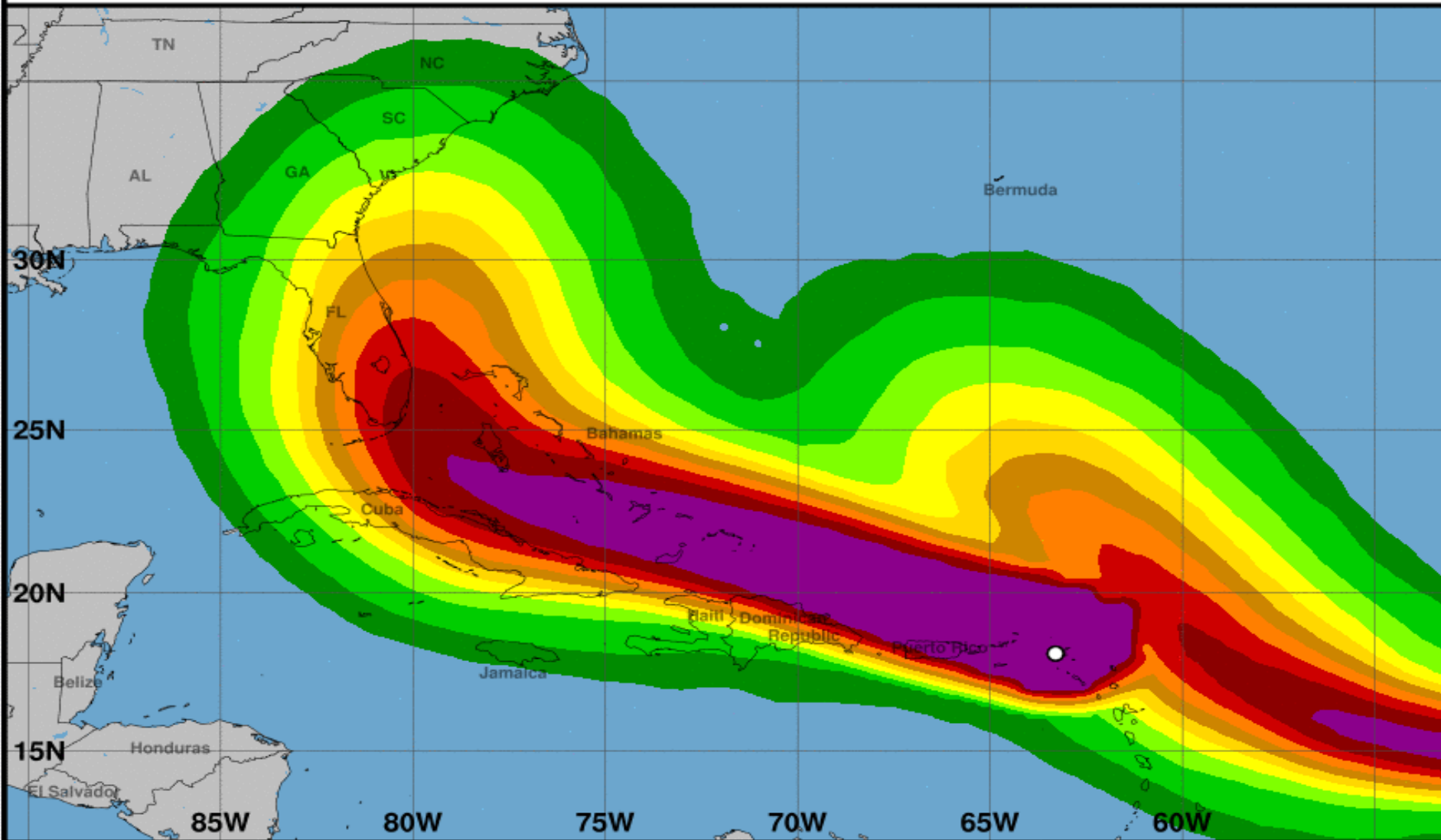
**Category 5 Irma**  
**5th Strongest Atlantic Hurricane on Record**





# Tropical-Storm-Force Wind Speed Probabilities

For the 120 hours (5.00 days) from 8 AM AST WED SEP 06 to 8 AM AST MON SEP 11



Probability of tropical-storm-force winds (1-minute average  $\geq 39$  mph) from all tropical cyclones  
○ indicates Hurricane Irma center location at 8 AM AST WED SEP 06, 2017 (Forecast/Advisory #30)



# Translating Scientific Findings for Purposes of Legal Decision Making

- G2i
  - G: Articulating the “weight of the evidence” for purposes of determining G.
    - See Austin Bradford Hill, *The Environment and Disease: Association or Causation?* 58 PROC. ROYAL SOC. MED. 295–300 (1965).
  - i: Describing the application of general research to the individual case.
    - E.g., “to a reasonable degree of scientific/medical/forensic certainty”
- Different sensitivity/selectivity considerations between science and law.
  - E.g., diagnosis of “mental illness” for purposes of drug treatment versus civil commitment.

THANK YOU