

Open Access and Open Data in Germany: current political developments vs. grassroots approaches

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Open Access – Open Data Conference

Cologne, 13th Dec 2010



Before we start ...

- Fourth paradigm
- Discipline (and other) specifics
- Incentives, awareness
- Responsibilities, infrastructure, support
- Funding, business models
- Copyright





Agenda

- **General framework for science**
- Network of players on different levels; their interests, strategies and approaches
- Two oppositional approaches in detail:
 - Official level: „Commission for the future of the information infrastructure”
 - Grassroots level
- **Conclusion**



Framework for science: general

- „Freedom of science“, principle of self-organization
- Public budgets' need to economise
- Strong copyright law
- Heterogeneity
- Paradigm shift toward digital scientific communication, data-driven science



Framework for science: significant official positions

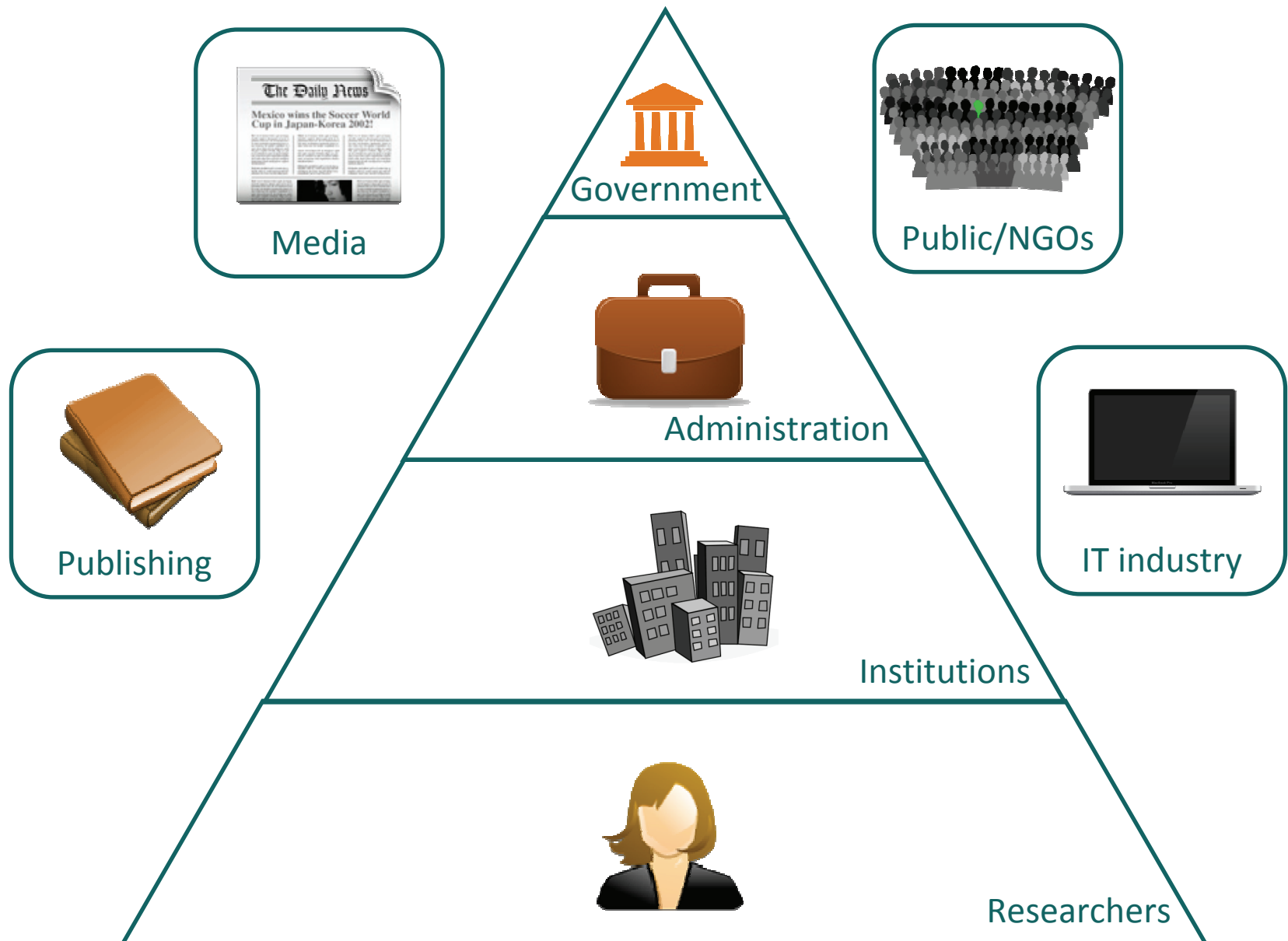
- BBB: Budapest, Bethesda, Berlin
- Göttingen Declaration on Copyright for Education and Research (2004)
- Funding bodies (DFG, ESF): funding programs and criteria regarding publications and data
- (Re)definition process: „Commission for the Future of the Information Infrastructure“ (2010)



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Levels and players





Government

- Strategy:
 - Balancing interests: support for both science and business location Germany
 - Funding of research in terms of self organization
- Approaches:
 - Revision of Copyright law (3rd basket)
 - Redefinition process underway („Commission for the future of the information infrastructure“)



Science administration: „Alliance of German Research Organizations“

- Strategy: co-operation and networking
 - Coordination of activities of member organizations
 - Establishing guidelines, e.g. common „Data Policy“ (2010)
- Approach: Lifting activities to the next level, e.g. with comprehensive publications, workshops, surveys



Science administration: funding bodies

- Strategy: targeted funding and active participation in developments through funding programs and underlying criteria
- Approaches:
 - Funding of OA green and gold projects, OA information platform on the web
 - Funding of Virtual Research Environment projects
 - Distinctive data funding strategy still under development



Science administration: research organizations

- Strategy: coordination of activities of their member institutions
- Approaches:
 - Advocacy, information policy, consulting, e.g. Helmholtz policy and work program
 - Centralized or distributed infrastructures for OA/D:
 - Support, funding of publishing activities in general, also OA
 - Setup, establishing of subject-specific or institutional OA and data repositories



Institutions: universities, research institutes

- Strategies vary, due to:
 - Autonomy vs. centralized organization, federalism
 - Policies of their umbrellas (impact?)
 - Infrastructure/support by libraries/IT to different extent
- Approaches:
 - Engaged in OA green, gold, VRE projects (mostly institutional approaches)
 - Disciplinary approaches by cooperations between universities and research institutions outside universities
 - Coalition for Action “Copyright for Education and Research”



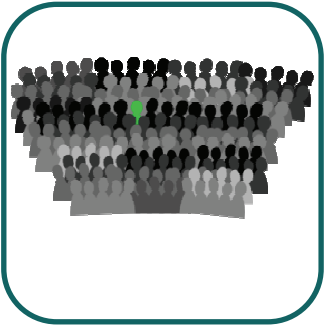
Institutions: information infrastructure

- Strategies:
 - Redefinition of tasks, keeping up with developments
 - (Applied) research
- Approaches:
 - Setup, establishing, integration of infrastructures for whole research process: OA green & gold, data, long-term archiving
 - Education



Individual researchers

- Strategies: interested in impact, career, leading figures within communities, minimizing effort
- National boundaries irrelevant
- Awareness for legal, financial & technical barriers rises
- Approaches:
 - „Petition for free purchase of scientific publications“
 - But also: oppositional initiatives like „Heidelberger Appell“
 - Engagement in OA/D initiatives as editors
 - Crowdsourcing: OpenWetWare, Dataverse, ResearchGate, ...



The public, NGOs

- Nothing of similar impact like the US' taxpayer alliance or student's initiative
- Crowdsourced „Open Data“: mostly non-scientific (governmental or geospatial data)
- Open Data Network/Open Knowledge Foundation
- Focus on:
 - Data journalism
 - Creating services using existing data



Media

- Strategy: often conservative position
 - Support for „Heidelberger Appell“, Swedish Chemists' initiative
 - General skepticism about digital scientific environment
 - Approaching decision-making units, triggering public debate
- Effects e.g. on copyright developments
- Awareness within internet/blogging community focusing on internet policy



Publishing industry

- Initially: ignorance or even rejection of OA and data, due to lack of proper business models
- Meanwhile: acknowledged as profitable and sustainable sources of income
- OA and data publishing services are offered, conditions vary
- Still: lobbying for a Copyright law protecting publishers' interests



IT industry

- Big market potential
- Building infrastructures for technical backbones (IBM, Dell, HP etc.)
- Developing and hosting platforms for data: archiving, sharing, analysis, visualization (Google, Microsoft, Amazon, Apple etc.)



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„Commission for the future of information infrastructure“

- Government-initiated approach to find a common conceptual basis for future developments
- Not externally written, but by relevant involved parties
- Therefore neither genuinely top-down nor self-organized
- Aim: „a master plan that:
 - Depicts an optimized landscape of information infrastructure in Germany,
 - Describes the necessary framework conditions,
 - Points out possible synergy effects, cooperations, and release of resources.“



„Commission for the future of the information infrastructure“

Timeline:

- Spring 2009: Government commissions a concept for the future of the information infrastructure in Germany, Task Force is compiled
- Fall 2009: Task force suggests conceptual framework, government accepts
- Winter 2009: statutory meeting; members of Steering Committee: Alliance et al.
- Since February 2010: Working Groups prepare concept
- Spring/summer 2011: reaction from government



„Commission for the future of the information infrastructure“

- Topics / Working Groups:
 - Licensing
 - Hosting/long-term archiving,
 - Non-textual materials
 - Retrodigitisation / cultural heritage
 - Virtual research environments
 - Open Access
 - Research data
 - Information literacy / higher education



„Commission for the future of the information infrastructure“

Recommendations regarding research data and Open Access :

- Research data:
 - „should be permanently stored and provided to the (expert) public and future (researcher) generations for subsequent use in terms of a sovereign task.“
 - Setup and establishing of a national alliance, internationally linked
 - Establishing of reputation-relevant set of incentives for researchers
- Open Access:
 - „Institutions of scientific infrastructure are to build sustainable Open Access infrastructures based on disciplinary demands and integrate them in existing and emerging knowledge contexts.“



Grassroots approaches

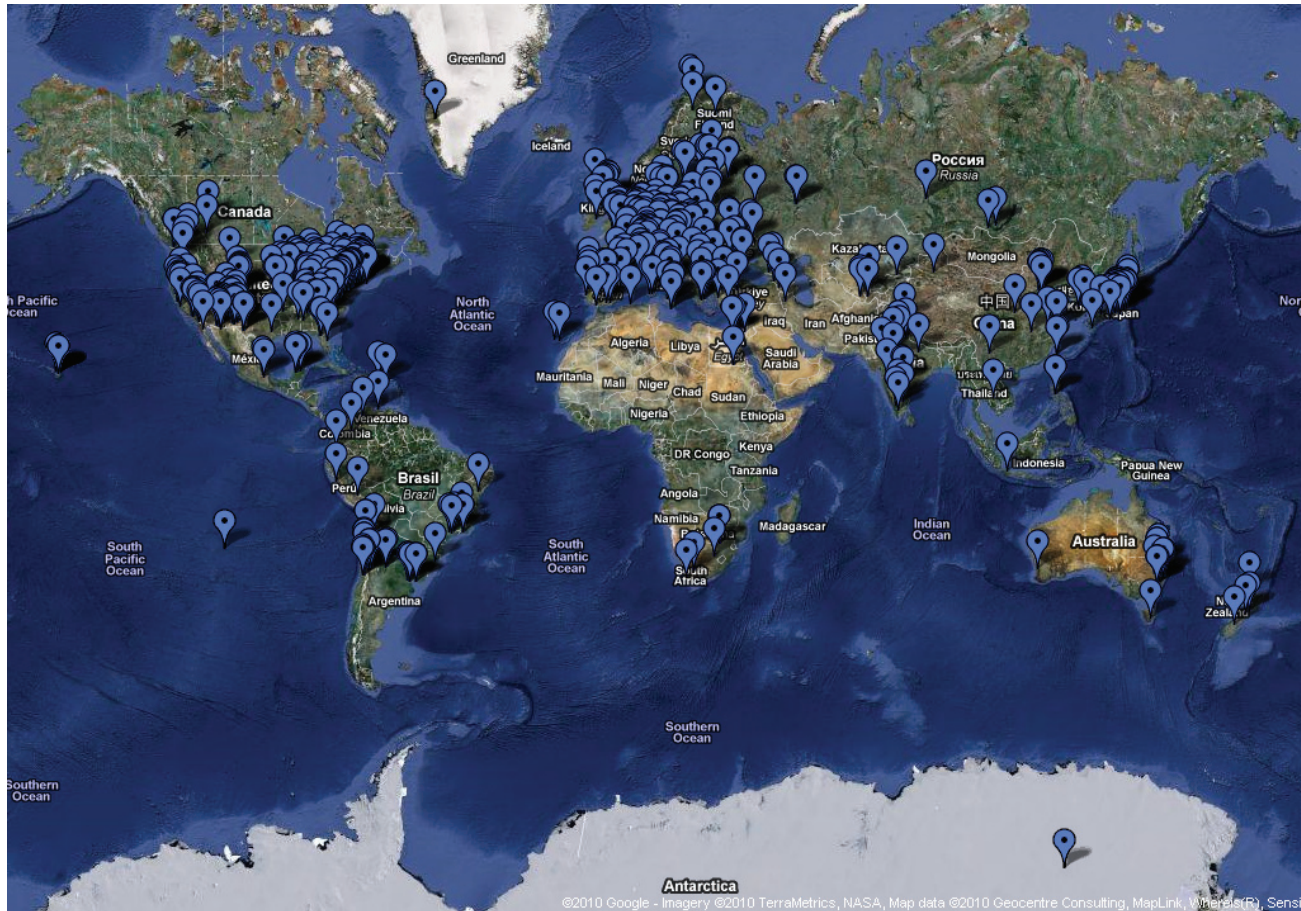
- Generally: impulse to act derives out of discipline-specific requirements of data-intensive research
- Therefore approaches often scientists-initiated
- When project establishes, infrastructure and administration tasks emerge, institutions and funding bodies get involved
- Infrastructure-driven approaches (might) have a very tough start or even fail



Grassroots approaches: prototypical examples

- Open Access:
 - arXiv: prototypical grassroots initiative, institutionally sustained
 - ResearchGate: low threshold for contribution to Open Access pool, incentive: profiling, reputation management
- Data:
 - Pangea: priming during International Geophysical Year 1957 → WDC approach born by scientists
 - ESSD: advanced form of integration of data and publications

Astronomy



→ Network of Virtual Observatories

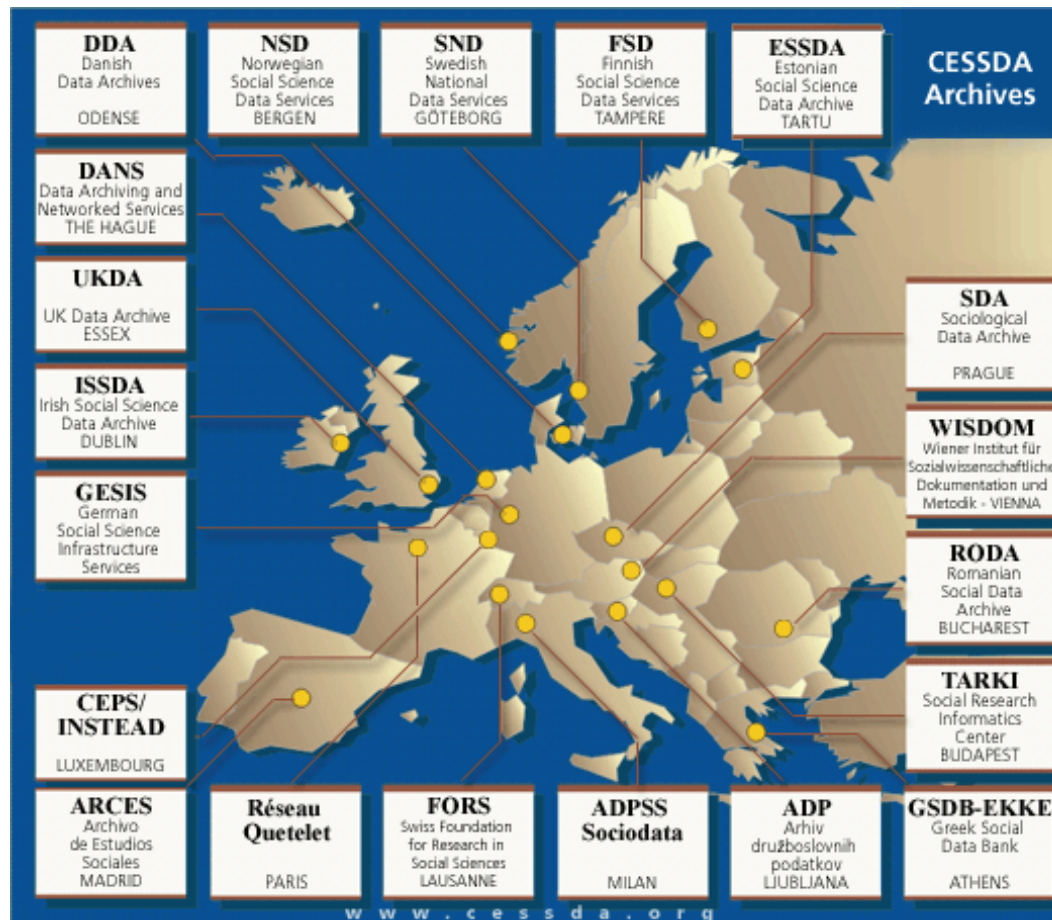
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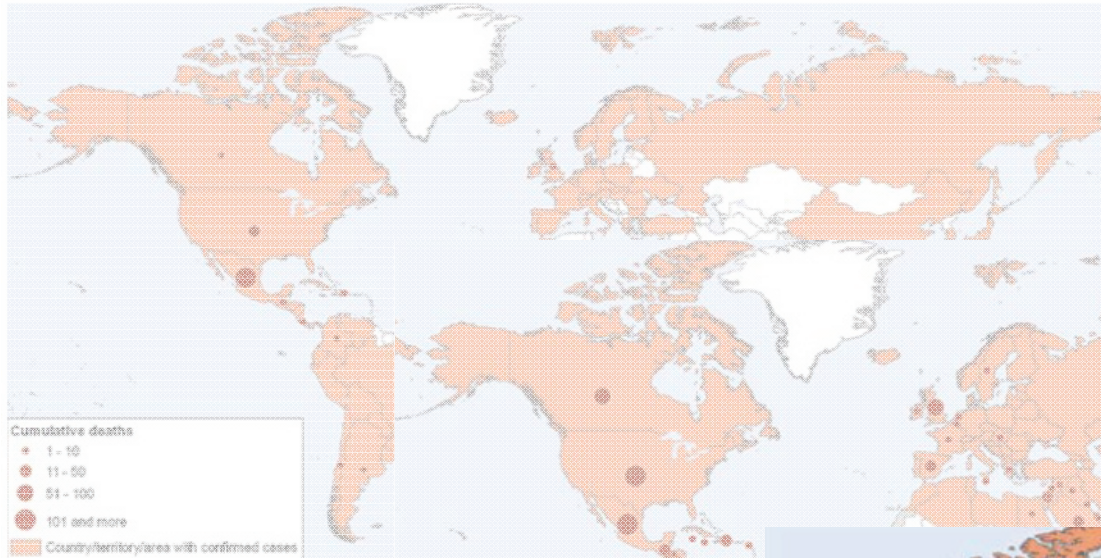
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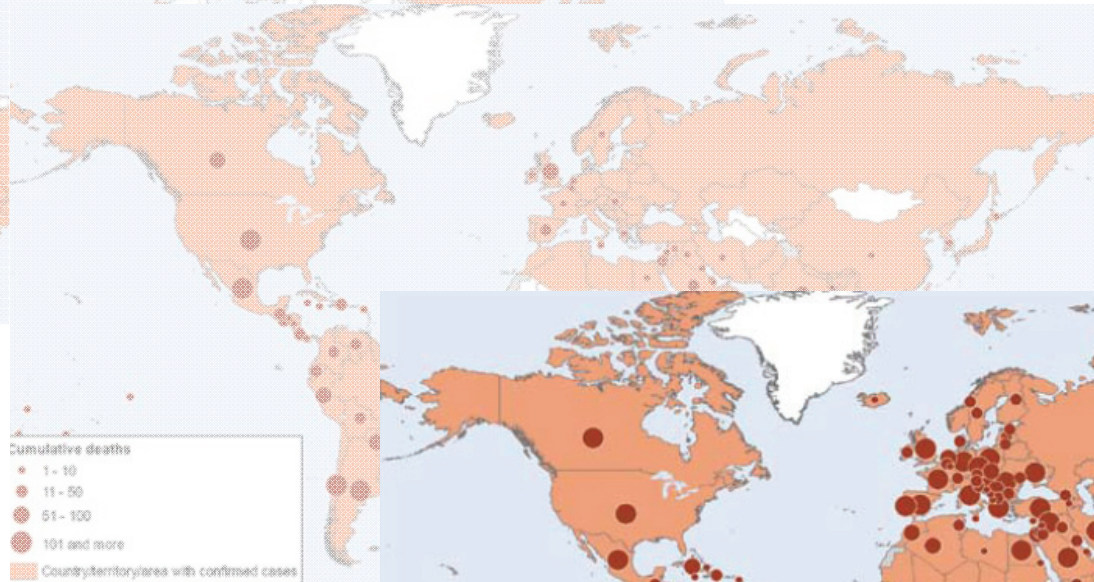
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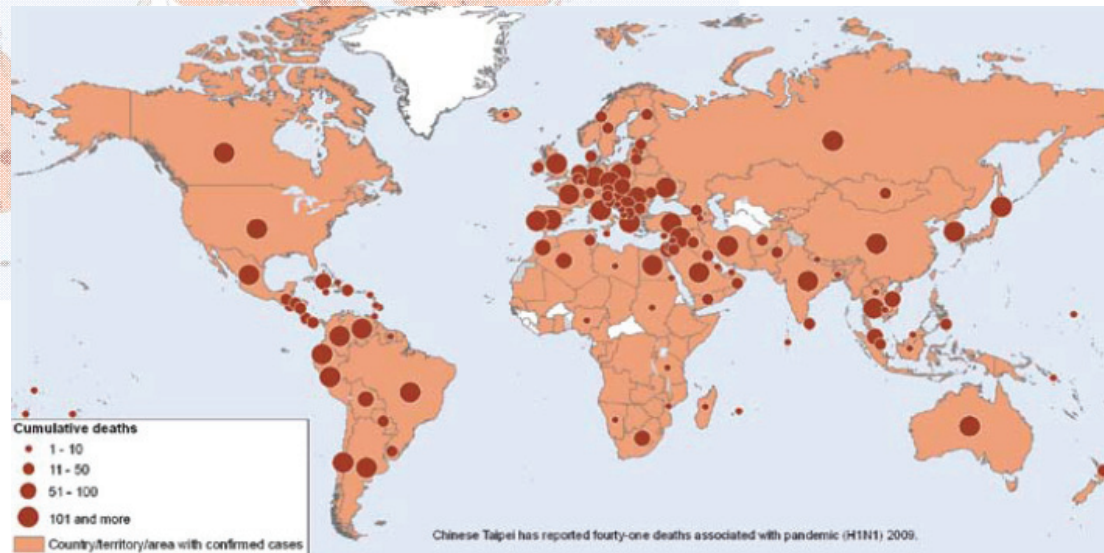
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
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*Upon this gifted age, in its dark hour,
Rains from the sky a meteoric shower
Of facts...they lie unquestioned, uncombined.
Wisdom enough to leech of our ill
Is daily spun; but there exists no loom
To weave it into fabric;
—Edna St. Vincent Millay (from Huntsman, What Quarry? 1939)*

THE CHALLENGE OF PREDICTION

The age of personalized medicine and genomics is upon us and we are facing a grand challenge—or a brick wall. One that has finally gained a near complete compendium of fundamental mechanisms, connections, and developmental processes—an encyclopedia of biology, bodies, brains, and behavior—cannot be accessed with the density and integration needed to develop holistic and robust models that generate useful predictions? Will we be able to distinguish between personalized genomic medicine and science? What new types of resources, data sets, and synthetic data will be needed to make correct diagnoses and recommend actions? What is my personal risk for Alzheimer's disease? What can I do about it today?

The complexity of biological systems implies that a parts list of mechanisms and processes, however complete, will not be sufficient for the task of making good predictions. What is a viable test of the accuracy of our models using a system that has the same level of complexity as human populations? I will describe an effective approach that

relies on genetic reference panels (GRPs) that can be used to make and test predictions from base pair to behavior. I will describe how scientists can retain their independence while explicitly contributing to a fabric of tightly woven quantitative data.

THE COLLECTIVE COST OF SCIENTIFIC INDEPENDENCE

Scientists are trained to think independently and critically. It is inevitable that we like to do things our own way, generating and using data from experiments we designed ourselves. This approach is not a self-indulgent luxury—it is an essential attribute of innovative science, enshrined in the ways we evaluate and fund new and ongoing research. Independence contributes to the stirring cacophony of competing ideas that moves us toward a deeper understanding of biological processes.

Yet independence has a cost. The scope of studies from single genes to entire genomes is enormous and the data generated are modest budgets. The collective result is a fragmented, half-hidden literature and a fragmentary and rapidly evaporating collection of hypotheses and data. The same data are often generated under different conditions, trained using varied paradigms, and measured using different equipment. Of course the pieces do not fit together. The cost of even a modestly sized data set is high. Designing and performing data integration of data sets and of key results is difficult; sometimes impossible. Ronald Fisher pointed out that “the number of experiments required to obtain a given amount of information is proportional to the square of the number of experiments required to obtain a given amount of information of results) ten or twelve fold for the same cost in time and labor” (Fisher, 1935). Fisher pointed this out in the context of genetic

“It is relatively easy to build a raft to float across a wide river. [...] To build a permanent bridge [it] requires the output of industries, the work of many specialists. [...] It is time to begin building the massive data bridges. [...] Perhaps the real challenge will be convincing both the community and its leaders that it is doable today.”





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Conclusions

- Catalyzing between grassroots and strategic level could speed up establishing and integration of infrastructures.
- Disciplinary approaches are able to reach critical mass.
- There is little interconnectivity between different disciplinary approaches beyond communities.
- Do OA and OD efforts have the potential to promote each other?

Thank you for your attention!

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