IASPEI Public Debate, July 26, 2013

Communicating risk and the role and responsibilities of scientists in modern society: the L'Aquila case and its impact

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Motivation

- ✓ Following a trial in L'Aquila, seven members of the Italian High Risk Commission and of the Department of Civil Protection have been sentenced to jail for failing to adequately assess seismic risk and warn the population.
- ✓ The trial and the sentence challenge the mechanisms used to provide scientific opinions to authorities and public, and set a precedent with possible repercussions extending to other regions and scientific areas.
- ✓ The trial exposes the difficulty of transmitting information, making prognoses and taking decisions in the presence of very large uncertainties.

IASPEI Press release on the l'Aquila sentence

The International Association of Seismology and Physics of the Earth Interior (IASPEI), on behalf of the world community of seismologists, expresses its deepest concern for the L'Aquila verdict and prison sentence, that condemns for involuntary manslaughter seven prominent Italian scientists and members of the Great Risks Commission of the Italian Civil Defense, due to negligence and errors in the evaluation and communication of the seismic crisis preceding the L'Aquila earthquake of April 6, 2009, resulting in the regretful death of 309 people.

The mission of IASPEI is to advance global seismological knowledge to mitigate the effects and minimize the victims of earthquakes. The trial in L'Aquila condemns some of IASPEI's most brilliant scientists, who dedicated their lives to the reduction of seismic risk and to whom go our sympathy and support.

IASPEI Press release on the l'Aquila sentence (cont.)

We do not express here opinions on the Italian judiciary system nor on the details of the sentence, but the trial in L'Aquila sets a disturbing and unprecedented case in linking the free expression of scientific opinions to casualties resulting from the collapse of poorly built or maintained buildings during earthquakes, with issues and ramifications relevant to the whole seismological community:

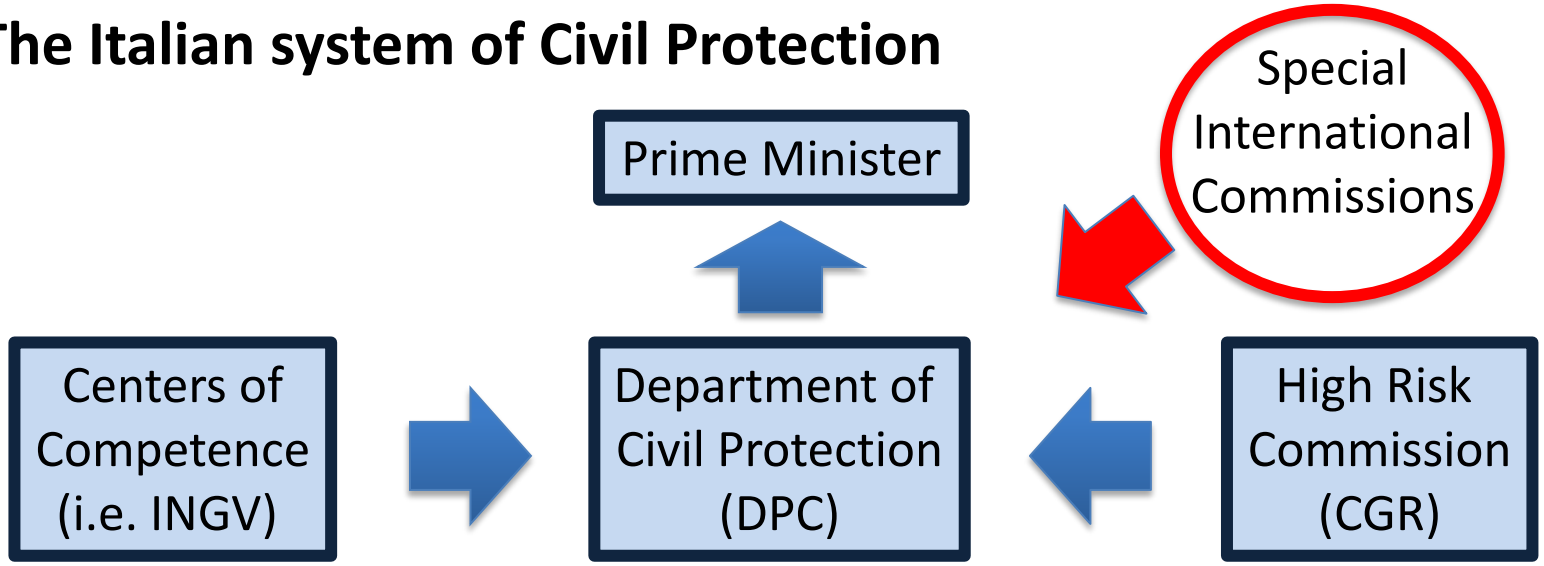
- ✓ IASPEI adheres to the statement on Freedom to Conduct Science and Responsibilities of Scientists of the IUGG and to the principles of the Universality of Science of the ICSU: the free thinking and conduct of scientific development is a principle of modern society and cannot be hindered or limited by threats of personal retaliation.
- ✓ IASPEI supports the development, testing and presentation of new evidence on earthquake forecasting and prediction; however, IASPEI is of the opinion that reliable short-term prediction of earthquakes is not possible at present; claims to the contrary may induce false expectations and incorrect behavior in the population and authorities, and are not supported by IASPEI.

IASPEI Press release on the l'Aquila sentence (cont.)

- ✓ When serving on high-level advisory panels for governments and authorities, scientists have the duty to provide the state of knowledge in a comprehensive and unbiased fashion, to enable authorities to take the required mitigation actions. This cannot be achieved under the threat of public prosecution. A negative impact of this trial and sentence will be to make scientists reluctant to serve on risk advisory commissions or express expert opinions.
- ✓ Communication in a language understandable to public and authorities is of crucial importance, including the communication of uncertainties associated to all evaluations and projections.
- ✓ Scientists cannot be held responsible for effects that are not under their responsibility. Governments and authorities are responsible to ensure that appropriate strategies and measures for risk mitigation are in place and applied. Roles and responsibilities in the earthquake mitigation chain need to be clearly defined, understood and adhered to.

IASPEI is confident that the L'Aquila case will provide the opportunity to develop a proper link between science, policy makers and society in order to avoid any type of miscommunication of information and scientific knowledge in the future.

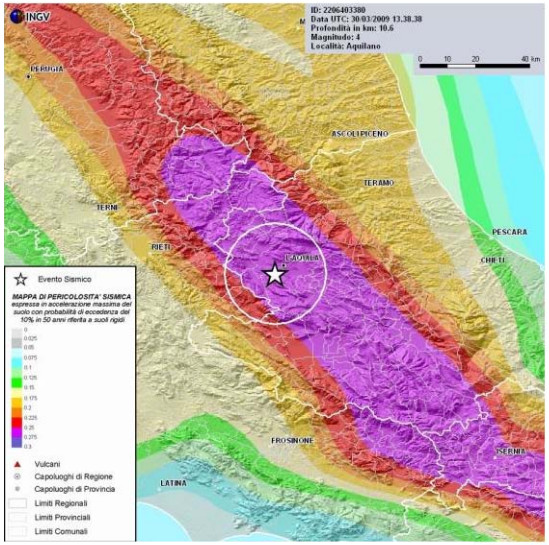
The Italian system of Civil Protection

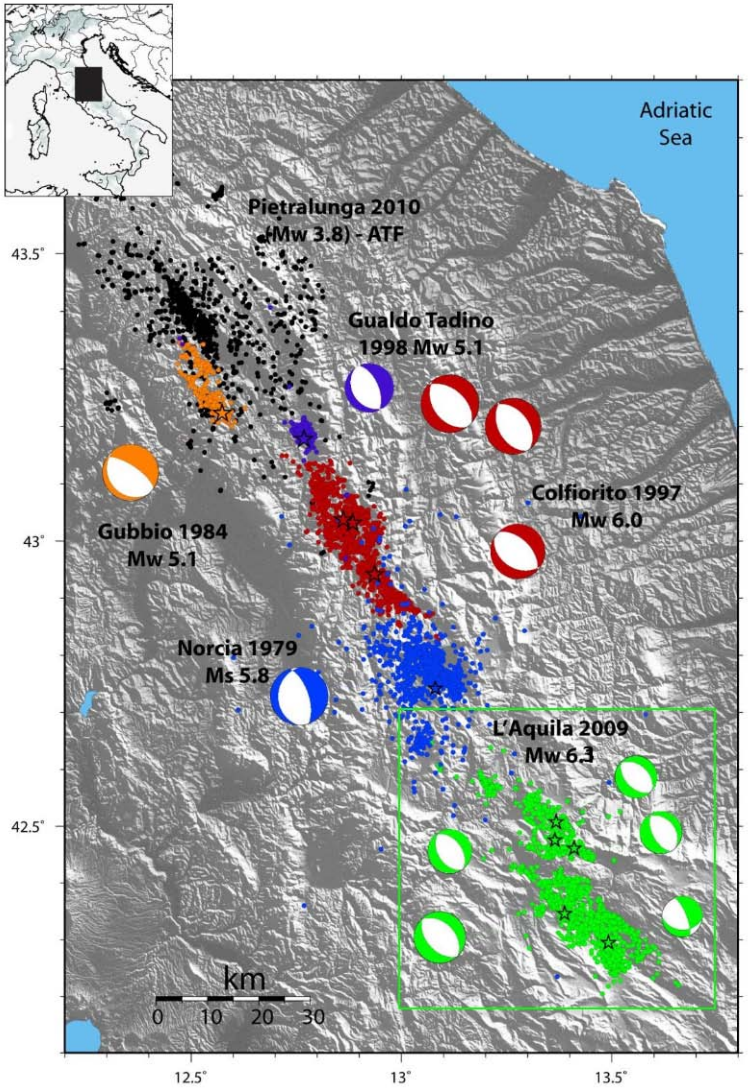


- ✓ The High Risks Commission (CGR) is is an independent advisory body nominated by the Prime Minister and responds to the DPC Director. It is composed by five groups of experts (9-12 experts in each group), covering all relevant classes of natural and technological risks, including earthquake risk (CGR-SRS).
- ✓ It is convened by the DPC to review risks and emergencies of national priority. Its acts and evaluations are submitted to the DPC Director and are not open. It does not communicate to the press or to the public.
- ✓ All measures of civil protection are decided and implemented by DPC.

The L'Aquila M 6.2 earthquake, April 6, 2009

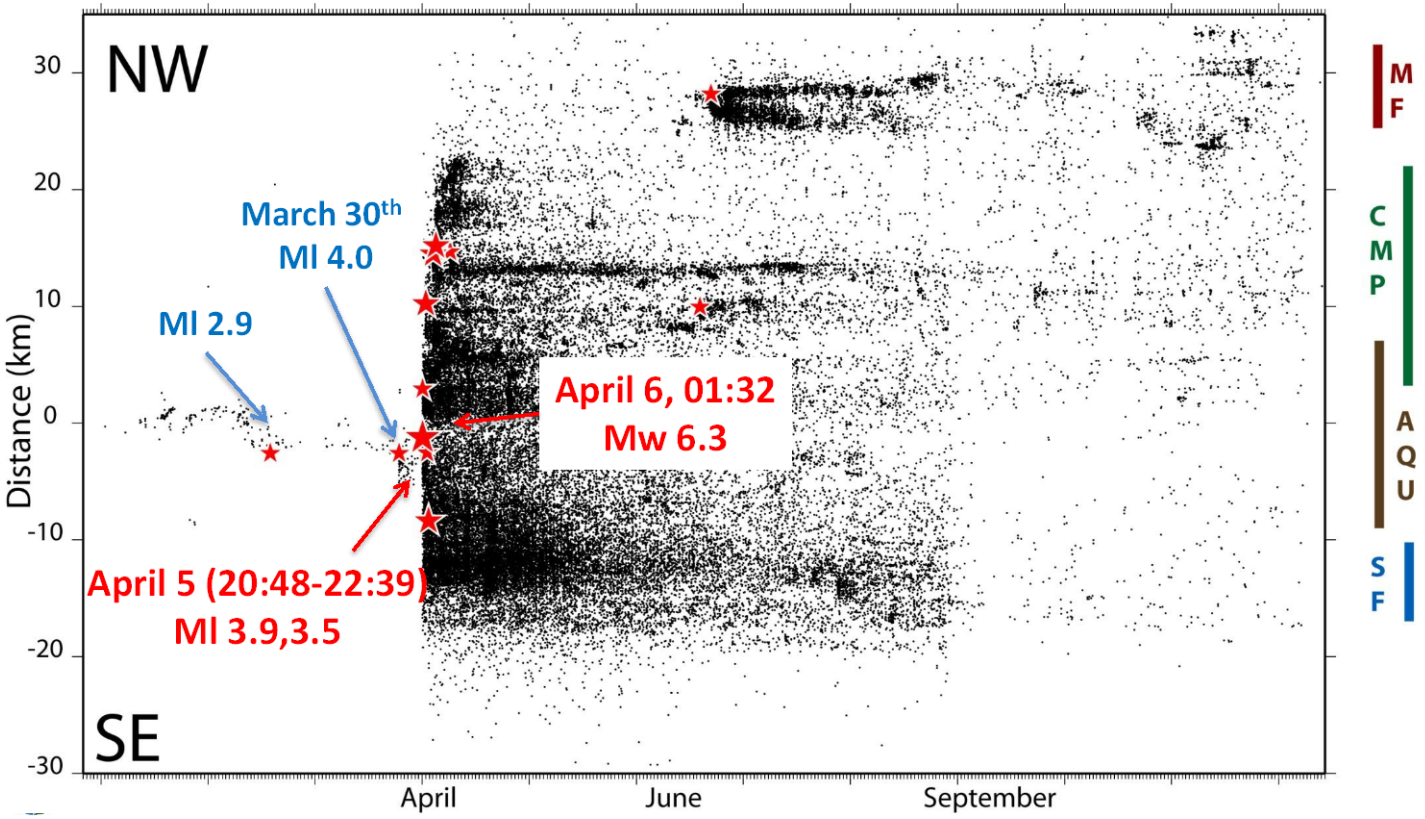
- ✓ L'Aquila is located in a very active area of the Central Apennines, with past earthquakes reaching M7; the last such events hit L'Aquila in 1703 and Avezzano in 1915, SE of L'Aquila, causing 30'000 casualties and total destruction.





The L'Aquila M 6.2 earthquake, April 6, 2009

- ✓ A seismic sequence started under L'Aquila in late 2008, with increasing magnitude and frequency; a damaging shock of Mw 4.2 occurred on March 30, 2009. On April 6, 2009, the Mw 6.2 mainshock struck.



The L'Aquila Mw 6.2 earthquake, April 6, 2009

- ✓ The shock caused significant damage, 309 deaths and over 2'000 seriously injured people in the city and nearby villages (Onna, Paganica). Over 90'000 people were evacuated.

The L'Aquila M 6.2 earthquake, April 6, 2009

- ✓ Over 1'000 classified historical buildings were seriously damaged; the historical center of the city has been declared as "red zone" and vacated.
- ✓ The reconstruction is very slowly starting, owing to the difficulty of retrofitting historical buildings according to the severe restrictions imposed by the present building code, resulting in public anger and migration of population.

L'Aquila ML6.2 earthquake, April 6, 2009

- ✓ Following the March 30 M4.2 event, on March 31 the High Risks Commission (CGR) met in L'Aquila
- ✓ The CGR meeting was called by the DPC Director (G. Bertolaso) to reduce anxiety in the population, unsettled by the release of contradictory information from a local Civil Protection official and by unofficial earthquake predictions issued by a local technician (G. Giuliani), using his own personal radon measurements
- ✓ Participants to the CGR meeting included four CGR members (F. Barberi, CGR Chair; E. Boschi, President INGV; G.M. Calvi, Director of Eurocentre; C. Eva, Uni.Genova), two DPC officials (B. De Bernadinis, DPC Vice-Director; M. Dolce, Director of the Seismic Risk Office, DPC) and one expert (G. Selvaggi, Director Centro Nazionale Terremoti, INGV)
- ✓ The meeting was attended also by many local officials, including the major of L'Aquila and the head of the local civil protection

L'Aquila ML6.2 earthquake, April 6, 2009

- ✓ The CGR meeting discussed the validity of earthquake prediction and examined a report by INGV describing the ongoing seismic crises and historical earthquakes in the area
- ✓ The CGR meeting lasted 40 minutes
- ✓ The minutes of the March 31 CGR meeting, released only after the main April 6 mainshock, contained the statements: *"large earthquakes are not predictable deterministically", "a large event in the short-term is unlikely but not impossible", "L'Aquila is one of the most hazardous areas in Italy"*
- ✓ The CGR meeting was preceded and followed by media communications, given by the DPC vice-head and by the CGR president, which were aimed at reassuring the population
- ✓ In the following days, the L'Aquila major requested the state of alert

L'Aquila trial: sentence

The seven seismologists, engineers and public officers participating in the CGR meeting of March 31 were sued by the families of some of the victims.

In the trial, the prosecutor argued that:

I. a direct causal link can be established between the reassuring message communicated to the media after the CGR meeting and the death of 37 people that changed their habits as consequence of that message,

II. the reassuring message can be ascribed to the *negligence, carelessness and incompetence* of the seven scientists and engineers, who in different capacities and responsibilities failed in *their duty to society of conducting a proper risk evaluation and of providing a clear, correct and complete information*, as expected by their function, resulting in manslaughter

- The judge confirmed these motivations and sentenced the seven scientists to six years in jail, interdiction from public offices and a first compensation fine of over 8M$. The appeal trial will start this year.

L'Aquila trial: motivations of the sentence

As detailed in the motivations of the sentence, the accusation of *negligence, carelessness and incompetence* was based on:

- ✓ *Insufficient, imprecise, generical and inefficient* analysis of the seismic risk in L'Aquila, failing to evaluate all the information available to the scientific community
- ✓ *Incomplete, imprecise and contradictory information on the nature, causes, hazards and future development of the seismic activity*:
  - *there is no reason to state that a sequence of many small earthquakes can be considered as a precursor to a large event*
  - *earthquake prediction has no scientific basis*
  - *a repetition of a strong event like the 1703 event is unlikely but cannot be absolutely excluded*
  - *the ongoing seismicity is a normal geological phenomenon, typical of this territory*
  - *there is no danger, the scientific community confirms that the situation is favourable because there is a continuous discharge of energy, there are intense events, but not very intense*

L'Aquila trial: public reaction

This court case presents unpleasant and possibly incorrect aspects – the feeling of summary justice, the risk of political contamination, scientists used as scapegoats – and sets in any case an important precedent.

- ✓ The international reaction of the scientific community was very forceful, arguing that Italy is putting again science on trial (i.e. Galileo).
- ✓ In Italy, many scientists agreed but many others argued that this freedom is not challenged in L'Aquila, what is challenged is the responsibility of scientists serving in advisory roles for the government.
- ✓ With few exceptions, the italian Government, Parliament, public opinion and media argued that scientists should take their responsibility and engage in advisory roles for the government, and should be prepared to pay for serious misconduct, as doctors and engineers do.
- ✓ The new CGR Commission, established in December 2011, resigned after the verdict, "demanding that legal safeguards be put in place for advisers, and that a clear division of responsibilities be made between scientific experts and government decision-makers" (Nature). It has since restarted its work.

Conclusions

- ✓ The L'Aquila trial provides a different view of how the work of scientists can be considered by the public and by the judicial system
- ✓ The outlook of the present L'Aquila trial is very uncertain, but it is very likely that the impact will extend to other applications in seismology and beyond seismology
- ✓ The Italian civil protection system is trying to minimize the impact of the L'Aquila trial on its work, but it has been accused of excessive alarmism and conservative attitude
- ✓ The roles and responsibilities of scientists serving in advisory committees need to be clearly defined and supported by robust and strictly followed procedures
- ✓ Our present tools and knowledge are insufficient to provide robust estimates and forecasts of hazards and seismic activity
- ✓ We need to develop appropriate language to communicate scientific information on risks and its uncertainties to the public, authorities and decision makers