



Long- and short-term operational earthquake forecasting in Italy before and after the recent L'Aquila earthquake

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The recent large earthquake that devastated the city of L'Aquila, on April 6 2009, gave us a unique opportunity to check and push forward the Italian operational long- and short-term earthquake forecasting capability. Here, we describe how this experience brought to light quite new challenges and how we face them. Four points deserve a specific mention. First, this earthquake gave us the unique opportunity to check the status of Italian operational earthquake forecasting at a long- and short-term scale, comparing the forecasts with real data in a pure prospective testing. Second, it has been the first time in which we provided – after the mainshock – daily one-day forecasts to the Civil Protection to manage at best the crisis. Here, we discuss the scientific and practical problems – and solution adopted – encountered in providing such short-term forecasts. Third, we discuss how the short-term probabilistic estimations have been practically used to manage the crisis. Basically, this experience demonstrates an urgent need for a connection between probabilistic forecasts and decision-making in order to establish – before crises – quantitative and transparent protocols for decision support. Four, we show how this event has forged new thoughts about operational earthquake forecasting – i.e., about how science can help to mitigate seismic risk –, and pointed out new scientific challenges for seismologists.