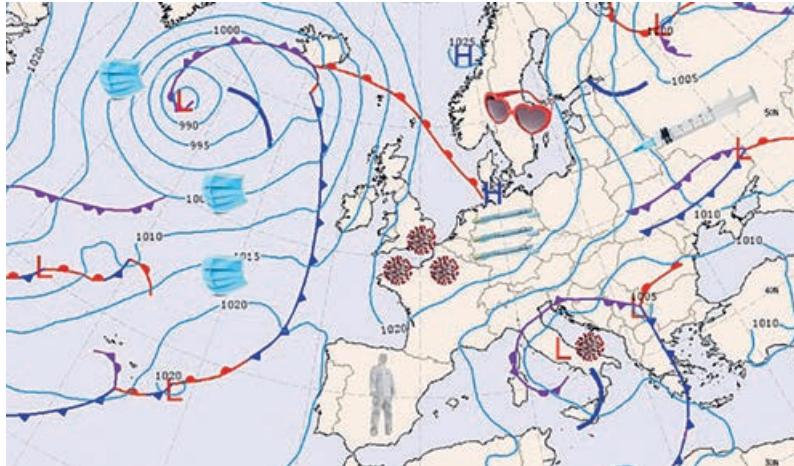


Forecast, uncertainty and COVID-19

alexandre.trajan@meteo.fr



“Forecasting is difficult, especially when it comes to the future!”

This quote from Pierre Dac is music to the ears of a meteorological forecaster, yet during spring of 2020 the main uncertainty was not the weather in the next few days but the global epidemic sweeping across Europe. COVID-19 totally turned our society upside down, our world was almost stopped. What will happen next? How are we going to get out of this slump? What will the health, social, economic and cultural consequences be? So many questions, so many difficult press briefings, so much anxiety and uncertainty.

Our leaders spared no effort in trying to manage this crisis and provide answers, solutions and to hold their chosen course. In spite of their attempts at skilful communication, we felt the enormous uncertainty hanging over us. We were able to sense the perishable aspect of this information which often remained evasive, sometimes incoherent and on occasion turned out to be completely false.

Yet we can have some sympathy as the equation of the problem is so complex with so many variables: evolving scientific knowledge of the virus, modelling the spread of the epidemic, material capacities for prevention and protection of the population, resistance of our hospitals and our health systems, societal acceptance of mitigating measures influenced by irrational fears or political

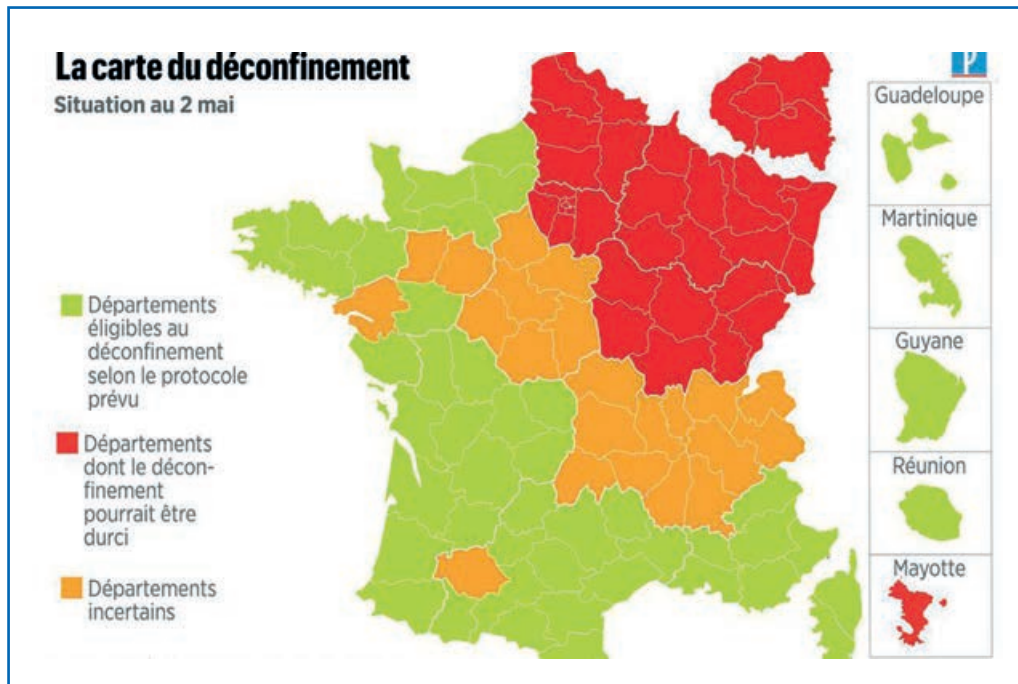
squabbles. Each parameter is difficult to predict and each variation greatly affects the outcome of this equation.

With our forecaster's eye, we can understand the discomfort of decision-makers. From all points of view, it looks like a "shitty" weather situation where several “equiprobable” scenarios with high stakes are combined e.g. thunderstorms on the evening of National Day open air parties, isothermal snow on the day holidaymakers set off for the Alps, heavy precipitation when the rivers are already swollen. This is the kind of situation where one degree makes the difference between rain and snow, where the dissipation of fog decides between a cold, grey day and beautiful crisp winter sunshine, where the position of a depression sends the storm to Paris or Picardy's farmlands.

The spread of the epidemic can be compared to thunderstorm degradation starting with a few isolated "clusters" and then degenerating into thunderstorms generalized over an entire region: where and when will the storm occur? We can compare the resistance of health systems to the rain-snow transition which drops isothermally during long-lasting rainfall: will the snow cover the mountain tops, the low hills or the major town in the valley? We can compare the ability to medically test the population to a southerly wind that sweeps in a cold air layer before the rains arrive: will there be insignificant slight rain or freezing rain ice turning roads into ice rinks?

At the time we all wanted to know what would happen next, because we need to project ourselves into the future: When would schools reopen? When would we go back to work? How long would the borders stay closed? What plans could we make for the summer? Would my company be able to recover from the crisis? This desire, or rather this need to know, accepts uncertainty but cannot stand to hear an "I don't know" that might be the most honest answer. We can wrap the answer with uncertainty, present several alternative scenarios, set out preconditions for the event or even talk about probabilities. Everyone is then free to think about the eventualities, outline a course of action, undertake something concrete or to prefer to wait for new information.

The parallel with the uncertainty that our forecasting community has always had on its hands is there! When "the stakes are high"; knowing how to talk about an uncertain weather situation with a certain probability, understanding our audience in order to adapt how we talk about it and knowing how to give the right elements that allow decision makers to protect life are all difficult tasks. In any case, anything is preferable to an "I don't know" because our forecasts, more than describing the weather, are decision-making tools. And to decide, we need tangible information, even if it turns out to be inaccurate.



Weather warnings? No Covid-19 warnings