Follow-up questions

What is variability in colony size? Is it really natural? How did EFSA assess this? What are the drivers? How can you exclude that background pesticides and diseases are drivers?

Our analysis focuses on background variability in colony size, i.e. what is the difference in the number of adult bees living in colonies under exactly equal conditions at any time of the year.
Background variability is not "really natural", as the vast majority of honey bee colonies in Europe are not living in natural conditions. The presence of the beekeeper is enough to make the living conditions of bees "not natural".
The methodology used for assessing background variability makes use of modelling techniques backed up by experimental and literature data.
There are many potential drivers of variability in colony size, with intrinsic biological variability being one of the main ones. In agricultural environments, it is possible that the presence of stressors (e.g. background pesticides and diseases) may increase variability between colonies, especially if colonies are exposed to different levels of those stressors. Nevertheless, in our model simulations, we have purposefully avoided to include any kind of pesticide exposure, in order to mimic perfect control conditions (something to be considered a golden standard also for any experimental work).

This the more since the data you use (EFSA review, input BEEHAVE) are not derived from pristine areas without stressors but from areas with agriculture.

Agricultural areas present important challenges for honey bees (and bees in general) which go well beyond pesticide exposure (e.g. habitat simplification, lack of food, increased competition, etc.). The final goal of the guidance document is to assess the risk to honey bees from pesticide use in agricultural landscape. Therefore, it makes complete sense to use a benchmark in agricultural settings, rather than in pristine areas (e.g. forests, high mountain pastures) which have completely different habitat characteristics.

How do you exclude that this variability is not the cause of the current bee colony collapse and made sure that it is harmless to bees?

Variability characterises all biological and ecological systems. In fact, it is the engine behind evolution and adaptation: without it, life wouldn't have survived until now.
Variability in colony size cannot cause bee colony collapse. Variability is not a stressor, so it cannot harm bees.

And related to this, if the metrics chosen by EFSA, % variability of colony size is related to the protection of bees.
We understand of course if risk managers chose for a higher percentile, it will be more protective. But more or less doesn't say anything on the level of protection. How will they be able to make a choice if the quantitative level of protection is unknown?

Defining the meaning of "level of protection" is not necessarily trivial. Risk managers have already indicated that the level of protection should be set on the basis of 'a negligible' reduction of colony strength. This is in line with the proposal from EFSA (2013) and this attribute is considered a solid indicator of the health status of a honey bee colony.
The whole exercise that EFSA is carrying out in the present context aims at providing the percentage difference between the mean colony size and the colony size corresponding to different percentiles. This percentage difference can be immediately translated into a reduction of the mean colony size, which is conceptually equivalent to the current 7% threshold. Hence, when the risk managers will

choose a certain percentile of the variability distribution, they will immediately be aware of the corresponding percentage difference compared to mean, and hence a quantification of the level of protection.

So, please, again, what is the relation between the % variability and the bee protection? What protection level of protection will 5th percentile lead to, and 10th and 50th?

See previous answer.

What is the science (please provide us with scientific studies) that show the relation (linear or whatever) between % variability and level of protection of bees.

From this question there seems to be an implicit understanding that the level of variability determines the level of protection, which is not the case. Information about the variability of honey bee colony size will be provided to the risk managers so that they can have an idea about how much colony can differ from each other in size, and most importantly how much they can differ from their mean size, even when they are not exposed to pesticides.
If instead the question was going in the direction of the relation between percentile of the colony size distribution and their distance from the mean colony size, this is the core set of results of our analysis.