A scientifically sound assessment of the risk to human health resulting from acute chemical releases is the cornerstone for chemical incident prevention, preparedness and response. Although the general methodology to identify acute toxicity of chemicals has not substantially changed in the last decades, there is ongoing debate on the current approaches for human health risk assessment in scenarios involving acute chemical releases. A survey was conducted to identify: (1) the most important present and potential future chemical incident scenarios and anticipated changes in chemical incidents or their management; (2) information, tools and guidance used in different countries to assess health risks from acute chemical releases; and (3) needs for new information, tools, guidance and expertise to enable the valid and rapid health risk assessment of acute chemical exposures. According to the results, there is an obvious variability in risk assessment practices within Europe. The multiplicity of acute exposure reference values appears to result in variable practices. There is a need for training especially on the practical application of acute exposure reference values. Although acutely toxic and irritating/corrosive chemicals will remain serious risks also in future the development of plausible scenarios for potential emerging risks is also needed. This includes risks from new mixtures and chemicals (e.g. nanoparticles).