The assessment of the impact of any kind of noise exposure on the population is a fundamental step in the process of noise abatement. Data about the exposure-response relationship for annoyance due to noise emissions from military shooting grounds are rather scarce at the time. In order to establish new legal exposure limit values for shooting noise from heavy and light weapons, we conducted an extensive telephone interview survey in several - mostly rural - municipalities affected by military shooting noise in Switzerland. The exposure assessment for each respondent was calculated based on the source models of a range of weapons and ammunitions of the Swiss army. Preliminary results suggest that although the responses of the population to noise from military weapons are rather dispersed, data should be sufficiently consistent to establish an exposure-response relationship which can help in defining a binding exposure limit value.