5.4.2 Instability model

The median proportion of simulated profiles classified as unstable ($\tilde{P}_{\text{unstab}}$) increased with increasing danger level from 0.03 at 1 (low) to 0.75 at 4 (high). The increase was significant between all consecutive danger level pairs ($p < 0.001$). As shown in Figure 9c, $\tilde{P}_{\text{unstab}}$ was considerably higher within the forecast core zone than fully outside ($p < 0.001$).

Findings were similar when exploring the correlation between $P_{\text{unstab}}$ and $D_{\text{sub}}$ (Figure 9d): $\tilde{P}_{\text{unstab}}$ increased monotonically with increasing $D_{\text{sub}}$ showing a strong, positive correlation ($r_s = 0.76$, $p < 0.001$). In addition, values within the core zone were always higher than outside the core zone. It is further noteworthy that $\tilde{P}_{\text{unstab}}$-values were similarly low outside the core zone for all sub-levels within 3 (considerable) ($\tilde{P}_{\text{unstab}} \leq 0.13$).