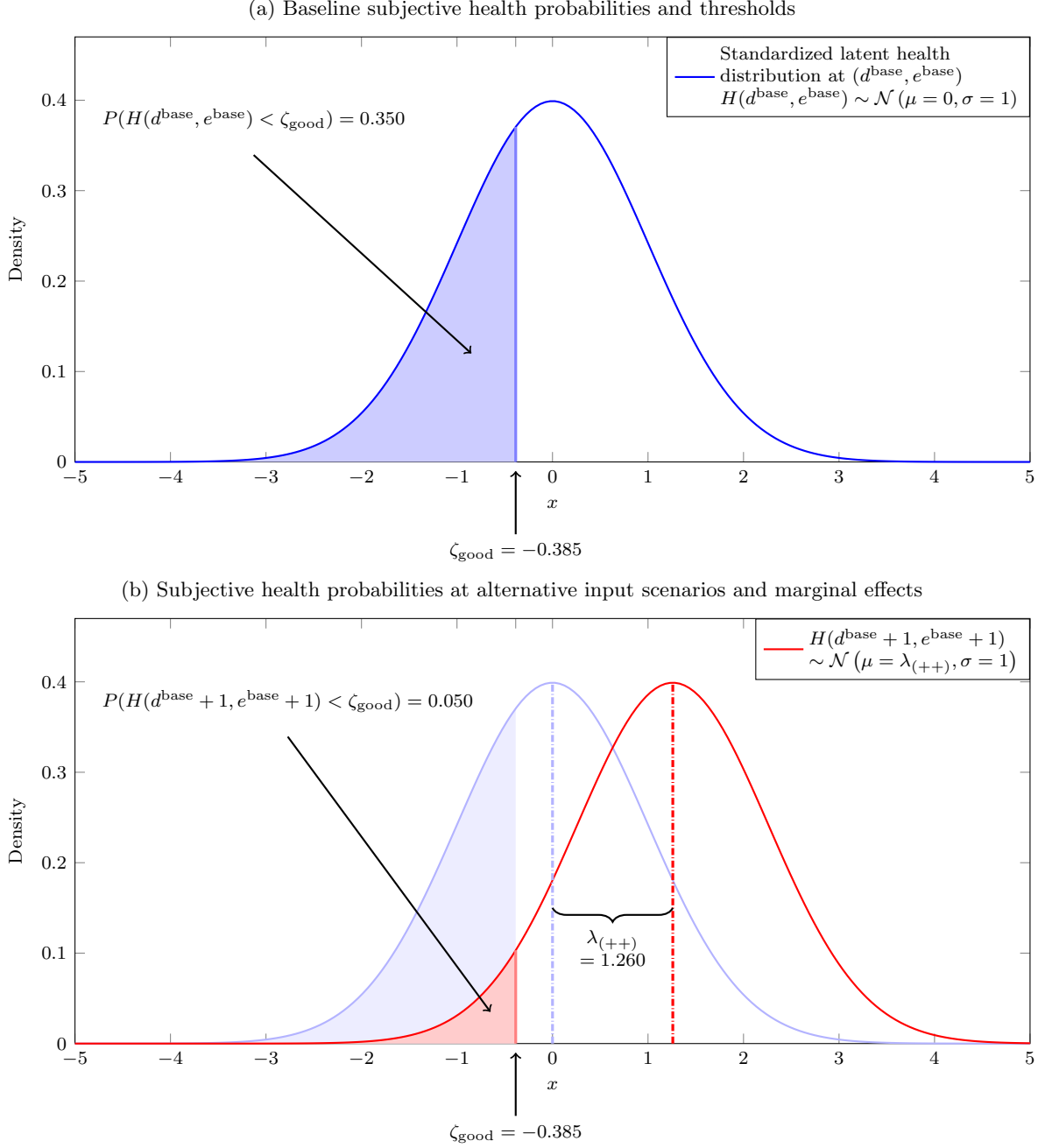Figure 1: Illustration of the identification of latent health thresholds and marginal effects given elicited subjective health probabilities across input scenarios and health status levels.

(a) Baseline subjective health probabilities and thresholds

(b) Subjective health probabilities at alternative input scenarios and marginal effects

Note: Next period latent health is a random variable. The latent health random variable at baseline input levels is $H(d^{\text{base}}, e^{\text{base}})$. The latent health random variable given increases in both input levels is $H(d^{\text{base}} + 1, e^{\text{base}} + 1)$. We elicit subjective probabilities that next period latent health is worse than "good" at the baseline and alternative input scenarios. We assume that latent health is a mixture of normals (in this case one normal). Since the scale and location of latent variables can not be identified, we normalize $H(d^{\text{base}}, e^{\text{base}}) \sim \mathcal{N}(\mu = 0, \sigma = 1)$. The normalized latent threshold for good health, ζ_{good}, can be identified by inverting the survey-elicited cumulative probability of having less than good health: $\Phi^{-1}\left(P\left(H\left(d^{\text{base}}, e^{\text{base}}\right) < \zeta_{\text{good}}\right)\right) = \zeta_{\text{good}}$. The marginal effect of increasing inputs is $\lambda_{(++)}$, where $\lambda_{(++)}$ provides a mean-shift of the baseline latent health random variable: $H(d^{\text{base}} + 1, e^{\text{base}} + 1) = H(d^{\text{base}}, e^{\text{base}}) + \lambda_{(++)}$. The marginal effect can be identified as the difference of inverted cdfs: We have $P\left(H\left(d^{\text{base}} + 1, e^{\text{base}} + 1\right) < \zeta_{\text{good}}\right) = P\left(H\left(d^{\text{base}}, e^{\text{base}}\right) + \lambda_{(++)} < \zeta_{\text{good}}\right) = \Phi\left(\zeta_{\text{good}} - \lambda_{(++)}\right)$, and hence $\lambda_{(++)} = \zeta_{\text{good}} - \Phi^{-1}\left(P\left(H\left(d^{\text{base}} + 1, e^{\text{base}} + 1\right) < \zeta_{\text{good}}\right)\right)$.