$X \sim N(0, \Sigma)$

$\Rightarrow X^T \Sigma^{-1} X \sim$ ~~$N(a, I)$~~ χ^2_d ~~$(0, I)$~~

$X^T \Sigma X \sim \approx N(0, \Sigma^2)^T N(0, \Sigma^2)$

longer x still gives larger vals so can still take 95% quantiles etc.