Densità

$$\phi(x;\mu,\sigma^2) = \frac{1}{\sigma\sqrt{2\pi}}\, e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

Ripartizione

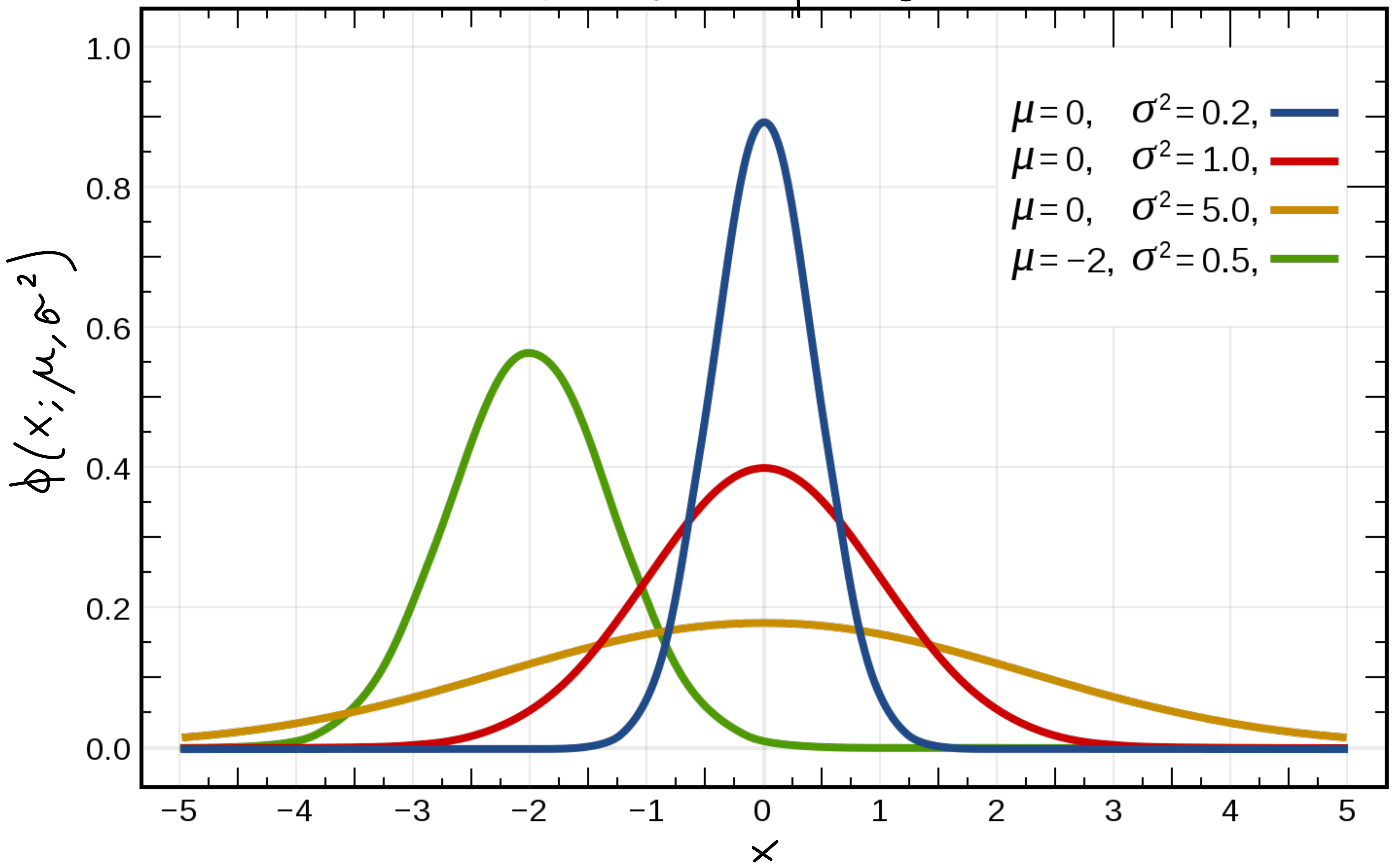
$$\underbrace{\Phi(x;\mu,\sigma^2)}_{\text{anche } N(\mu,\sigma^2)} = \int_{-\infty}^{\infty} \phi(x;\mu,\sigma^2)\,dx = \frac{1}{2}\left[1 + \mathrm{erf}\left(\frac{x-\mu}{\sigma\sqrt{2}}\right)\right]$$

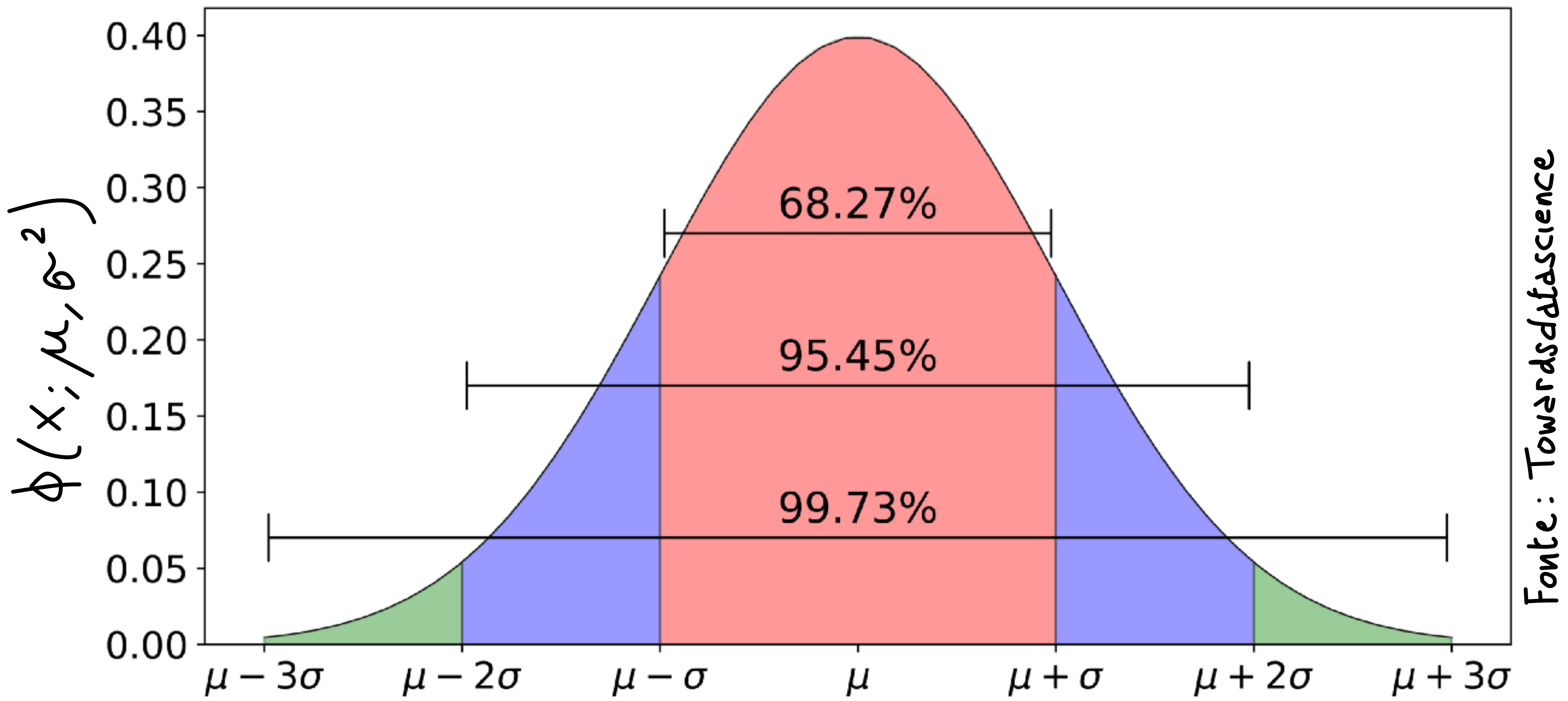
$$E[X] = \mu$$

$$\mathrm{Var}(X) = \sigma_X^2 = \sigma^2$$

LDR

Fonte: Wikipedia



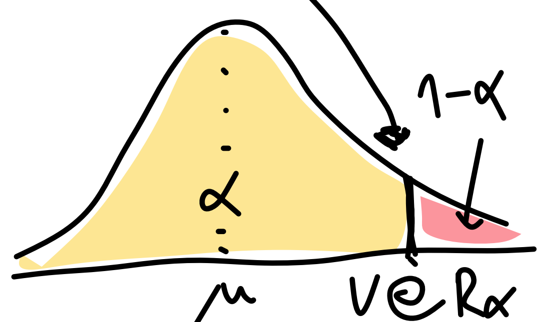


Se X è $\phi(x;\mu,\sigma^2)$ allora $Z = \frac{X-\mu}{\sigma}$ è $\phi(z;0,1)$.

E se Z è $\phi(z;0,1)$ allora $X = \mu + \sigma Z$ è $\phi(x;\mu,\sigma^2)$

Value-at-Risk

$$V@R_\alpha = \mu + \sigma \underbrace{\Phi^{-1}(\alpha)}_{\alpha\text{-quantile di } \phi(x;0,1)}$$



$$\Phi^{-1}(0.90) = 1.3$$
$$\Phi^{-1}(0.95) = 1.645$$
$$\Phi^{-1}(0.975) = 1.96$$
$$\Phi^{-1}(0.99) = 2.33$$
$$\Phi^{-1}(0.999) = 3$$

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