Appendix A

Parameterisations of NB1

English Wikipedia

Interpretation: distribution of the number of successes, k, until r failures have occurred.

$$P_{NB}(k; r, p) = \binom{k+r-1}{k} p^k (1-p)^r, \quad \mathrm{E}(X=k) = \frac{rp}{(1-p)}$$

- Support
  - $k \in \{0, 1, 2, 3, \dots\}$ – number of **successes**
- Parameters
  - $r > 0$ – number of **failures** until the experiment is stopped
  - $p \in (0, 1)$ – success probability in each experiment

French Wikipedia

Interpretation: distribution of the number of failures, k, before obtaining n successes

$$P_{NB}(k; n, p) = \binom{k+n-1}{k} p^n (1-p)^k, \quad \mathrm{E}(X=k) = \frac{r(1-p)}{p}$$

- Support
  - $k \in \{0, 1, 2, 3, \dots\}$ – number of **failures**
- Parameters
  - $n > 0$ – number of **successes** until the experiment is stopped (fr: *le nombre de succès attendus*)
  - $p \in (0, 1)$ – success probability in each experiment (fr: *la probabilitè d'un succès*)

German Wikipedia

Interpretation: distribution of the number of failures, k, before obtaining r successes. (ger.: *NB Distribution beschreibt die Anzahl der Versuche, die erforderlich sind, um in einem Bernoulli-Prozess eine vorgegebene Anzahl von Erfolgen zu erzielen.*)

$$P_{NB}(k; r, p) = \binom{k+r-1}{k} p^r (1-p)^k, \quad \mathrm{E}(X=k) = \frac{r(1-p)}{p}$$

- Support
  - $k \in \{0, 1, 2, 3, \dots\}$ – number of **failures** (ger: *Anzahl Misserfolge*)
- Parameters
  - $r > 0$ – number of **successes** until the experiment is stopped (ger: *Anzahl Erfolge bis zum Abbruch*)
  - $p \in (0, 1)$ – success probability in each experiment, (ger: *Einzel-Erfolgs-Wahrscheinlichkeit*)

$$P_{NB}(k; r, p) = \binom{k+r-1}{k} p^r (1-p)^k.$$