

(1)

Electric components exampleEvents $A =$  Acceptance of lot $L_1 =$  We have picked a lot with 1 def. $L_4 =$  " " " " " " " 4 "We decompose  $P(A)$  as

$$P(A) = P(A|L_1) P(L_1) + P(A|L_4) P(L_4)$$

$\overset{= .7}{\text{---}}$ 
 $\overset{= .3}{\text{---}}$

Then

$$P(A|L_1) = P(X_1 = 0)$$

with

$$X_1 \sim \text{HypG}(\overset{n}{3}, \overset{N}{10}, \overset{m}{1})$$

$\leftarrow \# \text{ draws} \quad \downarrow \quad \rightarrow \# \text{ defectives}$

$$P(X_1 = 0) = \binom{1}{0} \binom{9}{3} / \binom{10}{3}$$

$\overset{k}{\uparrow}$ 
 $\# \text{ components}$

②

In the same way

$$P(A|L_4) = P(X_4=0)$$

where

$$X_4 = \text{HypG}(3, 10, 4)$$

and

$$P(X_4=0) = \frac{\binom{4}{0} \binom{6}{3}}{\binom{10}{3}}$$

Conclusion:

$$\begin{aligned} P(A) &= P(X_1=0)P(L_1) + P(X_4=0)P(L_4) \\ &= \frac{\binom{1}{0} \binom{9}{3}}{\binom{10}{3}} \times 7 + \frac{\binom{4}{0} \binom{6}{3}}{\binom{10}{3}} \times 3 \\ &= 54\% \end{aligned}$$