Re-visiting Introductory Statistics: What Do We Really Need?

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Decisions, Decisions ...

- “So sad to that believers like yourself think that the "shot" is for "the common good". You really need to educate yourself because we have been seeing the absolutely tragic results of the "shot" play out every day. Over 9k dead and 430k severe adverse events as reported by the CDC from the shot. ...”

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- Our education system provides no training in how to compare competing risks ...

(Each condition implies the other.) The independence of the observations then permits factorization of the probability of the event on the right:

$$P(X_{(n)} \le y) = P(X_1 \le y, \ldots, \text{and } X_n \le y)$$
$$= P(X_1 \le y) \cdots P(X_n \le y) = [F(y)]^n.$$

In much the same fashion one can obtain the c.d.f. of the kth smallest observation in terms of the population c.d.f.:

$$P[X_{(k)} \le y] = P(k \text{ or more of the } n \text{ observations are } \le y)$$
$$= \sum_{j=k}^{n} \binom{n}{j} [F(y)]^j [1 - F(y)]^{n-j},$$

the individual terms in this sum being probabilities that in n independent trials precisely j result in an observation that does not exceed y. [The individual trials are of the Bernoulli type with $p = F(y)$.]

The density function of $X_{(k)}$ can be obtained from the above distribution function by differentiating with respect to y:

$$f_{X_{(k)}}(y) = \sum_{j=k}^{n} \binom{n}{j} j[F(y)]^{j-1} f(y)[1 - F(y)]^{n-j}$$
$$+ \sum_{j=k}^{n} \binom{n}{j} (n-j)[F(y)]^j [1 - F(y)]^{n-j-1}[-f(y)]$$

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- The math was next to useless for most learners ... ditto coding via R, Python ...

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  4. Intuitive inferential concepts.
  5. Communication of data and statistical ideas.

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- We learn by doing, but "drill" in applying useful statistical concepts is labour–intensive.