

Statistics double edged Sword: to be Used with Diligence and Discretion

Statistics has very wide applicability to solve complex issues due to its ability to substantiate any decision taken by acting as strong instrument of support to decision maker. On contrary, misrepresentation or misunderstanding of statistical information can lead to devastating results for all the stakeholders. This thing can be understood by one instance which took place recently. Once president of a renowned country in American continent said that there is no such thing like global warming, as the country was witnessing one of the coldest winters in the history. On this type of statements by head people started to believe that it may be right that global warming is a hoax and it is purely a scientist imagination. Later on, scientific community had to come forward to explain the impact of global warming, it was said that earlier winters in American continent used to last around 9 months, but now a days duration of winters has decreased to almost 6 months and intensity of winters has gone up. This is what exactly has happened as an outcome global warming. Similarly, if statistics is used appropriately, it can enable someone to take more informed and rational decisions about being right or wrong in any given situation. Misrepresentation of statistical information can come at high costs both to individual as well as to the society.

Angela Blair case is an infamous example from Europe that depicts how inappropriate usage of statistics while presenting evidences in the courtroom lead to injustice to the accused. In January 2000, Angela Blair was home alone with her healthy baby aged around two and half months due to her husband overseas assignments. On one regular day, in evening Angela Blair found her baby unresponsive and rushed her to hospital to have diagnosis. Medical staff at hospital put their best efforts, but Angela baby could not be saved. Post mortem report suggested natural reasons for death of baby which may be lower tract respiratory infection. Less than two years later in December 2002, Angela second baby also died at the age 3 months under almost similar conditions. This time post-mortem report indicated signs of bleedings at spinal cord and back of eyes. Second baby of Angela was a healthy baby and was under careful observation of Europe's Infants Care Program. Death of two children with same people under identical conditions, lead to some sort of suspicion on Angela and her husband for the authorities. Police arrested Angela and her husband on murder charges. Officials dropped charges against Angela husband on the pretext that when both babies died, it was Angela who was alone at home with babies. But for authorities it was difficult to prove that death of babies was not natural and its Angela who actually killed her two babies. All the relatives and friends' testimony further strengthened Angela claim. So much of the evidence for Angela trial in court came from medical experts. Using historical data medical experts suggested that two unexplained infants' death are quite rare in families such as Angela Blair. Experts further argued that sudden infant death syndrome (SIDS) is extremely rare (one in 8500 families) in middle class families such as Angela blair. One expert further argued that deaths of two infants should be considered as independent and probability of observing two SIDS infant deaths under identical conditions is computed as $1/(8500)^2$. It's not difficult to observe that statistical facts presented above can be considered as chances of

suspect's innocence is same as the chances of happening of a rare event. In reality these two probabilities that babies died die to SIDS and mother did not kill babies are not same. It can't be concluded that if chances for an event to take place are extremely rare, then it cannot be said that it will never take place. Using historical crime data and considering the opinion of expert while calculating probability for infants to die due to SIDS it was later found that probability that two infants was murdered in same house is just 1 in 2 billion. On the basis of these probabilistic estimations likelihood of 2 murders are very small and it is more likely that babies died due to SIDS rather than they were murdered by their mother. In 2007 Angela was acquitted from murder charges after additional medical evidences was presented before jury for a possible bacterial infection in second baby. Angela Blair died in 2010, from a suspected heart attack as a result of alcohol abuse. She spent almost 4 years in jail during the trial period because neither the judge and the prosecutor understood the importance of correctly interpreting numbers presented by the experts.

Angela Blair case urges due attention while using statistics for making judgements. All the parties involved in making decision must see two sides of the story under two competing hypotheses that suspect is guilty or not. The ratio for these two probabilities can be estimated not exactly calculated. Having realistic understanding of key statistical concepts can lead to better judgements.