Diagnostic Agreement Power

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Function to simulate diagnostic agreement power

```
# set up parameters

  prev. <- runif(1,0,.5) # if this is less than .5 power on positive agreement
  sens. <- 0.95          # true sensitivity
  target <- 0.85         # sens. - this is delta

  pow <- MKmisc::power.diagnostic.test(sens = sens., delta=sens.-target,
                                       power = 0.9, prev=prev., sig.level=.025,
                                       method=  "asymptotic")

    # feed in sample size estimate from canned function to simulation
    agree.pow <- function(n=ceiling(pow$n + pow$n1), prev=prev., sens=sens., spec=0.95,
                          target1=target, target2=target, target3=target) {

    # prevalence of +ves
    CTA <- rbinom(n, 1, prev) # CTA result
    CDX <- as.numeric(n)

    # use the sensitivity and specificity relationship to generate CDX result

    for (i in 1:n) {
      CDX[i] <- ifelse(CTA[i]==0, rbinom(1,1,1-spec), rbinom(1,1,sens))
    }

    tab <- table(CDX, CTA)[2:1, 2:1]                  # contingency table

    opa <- Hmisc::binconf(sum(CTA==CDX), n)           # overall percent agreement
    ppa <- Hmisc::binconf(tab[1],  sum(tab[,1]))      # positive percent agreement
    npa <- Hmisc::binconf(tab[4],  sum(tab[,2]))      # negative percent agreement

    o <- (opa[2] > target1)
    n <- (npa[2] > target2)
    p <- (ppa[2] > target3)

    output <- list(o,n,p)

    return(output)

  }


  # execute
  x <- NULL
```

```
    x <- replicate(1999 , agree.pow() )   # increase simulations if you desire

    # output
    names <- c("overall percent agreement power", "negative percent agreement power",
               "positive percent agreement power")

    for ( i in 1:3) {
      print(names[i])
      print( mean(unlist(x[i,])) )
      }
```

```
[1] "overall percent agreement power"
[1] 1
[1] "negative percent agreement power"
[1] 1
[1] "positive percent agreement power"
[1] 0.8864432
```

```
    pow # recall canned power calculation
```

```
     Diagnostic test asymptotic power calculation

           sens = 0.95
              n = 95.87442
             n1 = 570.8983
          delta = 0.1
      sig.level = 0.025
          power = 0.9
           prev = 0.1437888

NOTE: n is number of cases, n1 is number of controls
```

CONCLUSION

REFERENCES

COMPUTING ENVIRONMENT

```
R version 3.2.2 (2015-08-14)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 8 x64 (build 9200)

locale:
[1] LC_COLLATE=English_United Kingdom.1252
[2] LC_CTYPE=English_United Kingdom.1252
[3] LC_MONETARY=English_United Kingdom.1252
[4] LC_NUMERIC=C
[5] LC_TIME=English_United Kingdom.1252

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods
[7] base

other attached packages:
[1] MKmisc_0.993 knitr_1.15

loaded via a namespace (and not attached):
 [1] Rcpp_0.12.8         Formula_1.2-1       cluster_2.0.3
 [4] magrittr_1.5        splines_3.2.2       munsell_0.4.3
 [7] colorspace_1.3-1    lattice_0.20-33     plyr_1.8.4
[10] stringr_1.1.0       tools_3.2.2         nnet_7.3-12
[13] grid_3.2.2          data.table_1.9.6    htmlTable_1.7
[16] gtable_0.2.0        latticeExtra_0.6-28 htmltools_0.3.5
[19] lazyeval_0.2.0      yaml_2.1.14         survival_2.40-1
[22] assertthat_0.1      digest_0.6.10       tibble_1.2
[25] Matrix_1.2-2        gridExtra_2.2.1     RColorBrewer_1.1-2
[28] ggplot2_2.2.0       acepack_1.4.1       rpart_4.1-10
[31] robustbase_0.92-6   evaluate_0.10       rmarkdown_1.1
[34] stringi_1.1.2       DEoptimR_1.0-8      scales_0.4.1
[37] Hmisc_4.0-0         chron_2.3-47        foreign_0.8-65

[1] "C:/Users\\User\\Documents\\GIT\\Diagnostic-Agreement-Power"
```

This took 16.94 seconds to execute.