# *Qualified Statistics*

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# QUALIFIED STATISTICS
Guy Haworth

In his review of the chess material in *Games Of No Chance* (EG #136, pp. 114-118), John Beasley makes some excellent points about endgame statistics that are worth further illustration and emphasis. The ideal is that *illegal* positions should not be included in an endgame table (EGT) and each *equivalence class* of legal positions, *equivalent* in the sense that they can be transformed into each other by rotation and reflection of the board, should be represented by exactly one position.

However, illegal positions are included and legal positions sometimes have two representations.

Consider the following:

$P1 \equiv \{$wKc3 wQc2 / bKa1 WTM$\}$
$P2 \equiv \{$wKc3 wQb3 / bKa1 WTM$\}$

*P1* and *P2* are equivalent but both are typically included in EGTs. Nalimov's '2' maximal Distance to Mate (DTM) btm **8000** wins for White are actually both equivalent to {wKa1 wQf1g1 / bKg7 bQb5d5 BTM} with DTM = 100 plies. *P1* and *P2* are also in fact *unreachable* as Black has no preceding move but both will be scored 1-0.

Other *unreachable* positions have featured impossible single or double-checks, e.g., from a single Pawn on its home square, from the side to move (Stiller, 1992) or from combinations of QQ, RR, NN or

*x*P. Karrer (2000) highlights the **4000.11** illegal position {wKe6 wQc3 wPg5 / bKa4 bQe2 bPd7 WTM}, a maxDTM position for wP(g5) and bP(d7) assuming "P=Q promotions only".

Readers will know of other types of *unreachable* position. These errors inflate absolute counts of positions and change %-densities of results slightly.

Wirth removes from consideration one of two representations when both Kings are on a long diagonal in a pawnless endgame: Nalimov does not. Stiller is unique in not marking as *illegal* positions with the side to move giving check.

The *reachability* of positions has not been completely confirmed by EGT authors to date.

Thus, for **8000**, Stiller cited a density of 83% wtm wins for White while Nalimov gives 61.10% and Wirth the correct 61.07%.

Karrer now exhibits best practice by filtering extracted sets of positions, removing double-representations and some illegal positions.

## References

Karrer (2000). KQQKQP and KQPKQP≈. *ICGA J.*, Vol. 23.2.

Nalimov, E.V., Wirth, C., and Haworth, G.McC. (1999). KQQKQQ and the Kasparov-World Game. *ICCA J.*, Vol. 22.4.

Stiller, L.B. (1992). KQNKRR. *ICCA J.*, Vol. 15.1.