REVIEW

TITLE: A new family of distributions: properties and applications
AUTHORS: Gauss M. Cordeiro, Maria do Carmo S. Lima and Rafael D. Marinho

Comments for the authors:
The paper is concisely written, well-organized and presents a new family of distributions that emerges by combining the Marshall and Olkin-G and Gamma-G classes.
Nevertheless, there are some points that should be taken into account, which I divide into major points and minor points.

Major points:

1 – The equality h(x)=f(x)/(1-F(x)) is a well known relation between hazard, density and survival functions. It is not a definition of density or risk functions. Therefore, in page 3, line 12, the part of the sentence "defined by h(x)=f(x)/(1-F(x))" should be omitted.

2 – The expression (3.1) in page 6 corresponds to the log-likelihood of a MO-Γ-G distribution, considering a Weibull distribution for G (although there is an error in the last sum of line 1), not a general distribution with a η vector of parameters. Therefore, the text or the expression should be written accordingly.

3 – It is not clear why it is considered the Weibull distribution (for G) in Figure 1, eventually in expression (3.1) and in the applications, whereas for the simulations it is chosen the Dagum distribution. These choices should be clarified.

4 – As the Dagum distribution is used in the simulations, the generated PDF should also be in Table 1.

5 – As the goodness.fit function gives several statistics, the authors should justify why they only chose the Anderson Darling and Cramer-von Mises statistics.

Minor points:

1 – page 1, line 8 of Section 1, correct for "vector".
2 – page 2: confirm the expressions of $Q_{MO\text{-}G}(u)$ (line 9) and W (line22).
3 – page 2, line -4 of Section 1, correct for "are".
4 – page 3, line 4, where it is written "gamma density unit scale and shape a>0," I suggest replacing it by "gamma density with unit scale parameter and shape parameter a>0,".
5 – page 3, 3rd paragraph, replace "Table 2" by "Table 1".
6 – page 3, line -8, correct for "(0,1)".

7 – Figure 1: I suggest to change the lines to different types (even letting the colours as they are) so as to enable the interpretation in a black and white print. Also, the letters assigned to the parameters must agree with those in Table 1 (and, eventually, with those in expression (3.1)).

8 – page 3, lines -8, -7, where it is written "of the baseline QF $Q_G(.)$." I suggest replacing it by "of the QF of the baseline distribution G, $Q_G(.)$."

9 – page 3, line -6, correct for "(1.1) and".

10 – page 7: the label of the table should be on the top, like the rest of the tables.

11 – page 11, line 4, correct for "distribution".

12 – In expressions (6.4) and (6.6), try to improve the output as the reference numbers are to close to the formulas.

13 – I suggest to make the labels of Figure 1 and of tables in LaTeX, not in R.

14 – The references "R Core Team. …" and "Rizzo, …" are in the wrong order.