

# Review of Manuscript egosphere-2025-908 R1

I thank the authors for their detailed replies to my previous comments and for having taken them into account in the revised version of the manuscript. While the lack of confrontation of the proposed archetypes against risk data or models that demonstrate the relevance of the classification is still a shortcoming, the more in-depth discussion of this limitation as well as the new section on the vulnerability profiles have contributed to improve the quality of the paper. I recommend this work be published after addressing the following minor comments and edits.

## Minor Comments

1. L190-192, L205-206, L413-415, Tables 1 & 2, Fig. 3, etc.: While the authors have improved the presentation of the variables they considered with respect to the original manuscript, it is still not straightforward to navigate this matter throughout the manuscript. Section 2 should be more explicit regarding the fact that a larger number of indicators were considered for inclusion but only a sub-set was used, and enumerating the reasons for doing so (e.g., correlation analysis, availability). For example:

- a) “Dependency ratio” is mentioned in L190, Table 1, Fig. 3 and the lines before it, but then it is dropped. Only in the analysis around Fig. 3 it becomes clear that the variable was considered but then discarded due to it being strongly correlated to other variables that were selected in the end. But when reading L190 it gives the impression of being used.
- b) The indicator names in L190-192 is different from that in Table 2, and line 192 directly refers to this table. This makes it very confusing for the reader, who might also wonder why the dependency ratio is not in the table (if they go and see the table when directed to do so in L192, before reading the correlation analysis).
- c) L205 mentions 19 attributes, Table 2 includes 12 variables, Fig. 3 includes 14. This is confusing for the reader if it is not accompanied by an explanation early on in the text (i.e., Section 2).

Perhaps it would help to add text around certain lines to clarify early on to the reader that not all initially-considered indicators were actually used for the clustering analysis. For example, L190-192 could read: “The complete list of socio-economic indicators considered includes age, dependency ratio, ... [...] ... and percentage of women in the workforce, though some indicators were not used for the final clustering process due to their strong correlation with other selected variables (Table 2)”, or similar. I am not saying that the details of Section 3.1 should be stated earlier, but the overall strategy (considered a large number of indicators initially, made a selection of a sub-set to be used for the clustering process) should.

2. L744-747: If I am understanding correctly, the composite index of Sibilía et al. (2024) is not used by the authors. If so, I recommend removing the lines “In Sibilía et al... [...] ... and environmental”, as they include too many details about an index that is irrelevant to what follows.
3. L767, Fig. 10: Several points here:
  - a) The figure and discussion focus on the average ISI but no dispersion is reported. The dispersion is relevant to understand how different the results for each archetype are from one another, especially because so many of them have very similar mean ISI values. Please consider including some sort of measure of dispersion (whichever is appropriate to represent the numerical results) and include it in the discussion.
  - b) It is interesting that the three sub-clusters of cluster 3 have very similar ISI values. Their SoVI values are similar as well (Table 3). Are the ISI dispersion values similar as well? Are there any interesting insights to the method or the nature of these archetypes that are worth discussing in the text?
  - c) Following up from the previous point, looking at certain archetypes one gets the impression that the mean ISI values are highly correlated with the mean SoVI values (Table 3). For example, the three subclusters of cluster 3, as mentioned above, the fact that cluster 1 has the lowest ISI and one of the lowest SoVI values (albeit not the lowest), the fact that subclusters 2a and 2b have very similar ISI values, larger than subcluster 2c, and present the same pattern in their SoVI values, the fact that 8a has both the highest ISI and SoVI

values, etc. However, other archetypes suggest the opposite. For example, subclusters 9a and 9b have opposite trends of ISI vs SoVI, cluster 6 has one of the lowest SoVI values but not so much regarding ISI, etc. It would be interesting and insightful to explore these and similar observations and comment about their potential meaning and significance, if any.

4. L880: In lines 824-825 you discuss as well the limitations of risk modelling for the purpose of validating the archetypes. I suggest adding this to the sentence “due to the lack of fully integrated social and institutional vulnerability data, as well as limitations of risk modelling”.

## Edits

1. L104: Add a comma after “first” (i.e., “first, broad urban and rural...”).
2. L167: Erase “acknowledging that”.
3. L168: Add “the” between “factors of” and “built environment”.
4. L175: “Greater population” instead of “Higher population”.
5. L177: Consider starting a new paragraph at “The degree of urbanisation...”.
6. L242: Should it say three categories, instead of four?
7. L262-264: “minimize”, “prevent” and “enhance”. These three items follow the sentence “in order to (infinitive verb)”.
8. L404-411: The text says “proportion of under 15 aged” while Fig. 3 says “proportion of population under 14”. Is it 14 or 15? Moreover, please change “proportion of under X aged” (this is grammatically incorrect) into “proportion of population under X” or “proportion of age X and under”.
9. L418, Table 2: I infer the variable “Population class” refers to section 2.4. If so, consider rephrasing as “Residential population class” or similar, to increase consistency with the main text.
10. All throughout, “urban degree” does not read well. Replace with “degree of urbanisation”.
11. All throughout, “urban centredness degree” does not read well. Replace with “degree of urban centredness”.
12. L667, Fig. 9: Introducing the map with the Italian regions is a useful addition. However, the resolution of the image is quite poor.
13. L877: “empirical and external validity were only partially addressed” (not “was”).
14. L877: Broken link...? “Fare clic...?”