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COMMENTS

Comment on: Data-driven classification of health status of older adults with diabetes: The diabetes and aging study

To the Editor:

We have read with great interest the recent article of Prof. Elbert Huang and colleagues¹: “Data-driven classification of health status of older adults with diabetes: The diabetes and aging study”. The authors aimed to classify a cohort of 105,786 older adults with type 2 diabetes based (the Kaiser Permanente Northern California Diabetes Registry) on the patients’ comorbidities. Using latent class analysis, a rigorous method of classification, they identified three different health status classes with distinct patterns of comorbid conditions. They found that the three classes differed significantly in terms of future cardiovascular events, hypoglycemia, and mortality. These results confirm previous work by the authors using a different data set of patients.²

Individualization is the cornerstone of the appropriate management of type 2 diabetes, and in particular of the management of glycaemia by glucose-lowering treatment in older patients. As this population is particularly heterogeneous in terms of comorbidities, functional status, health status and thus life expectancy, the benefits that can be expected from glucose-lowering treatment are not the same for all patients. Therefore, recent clinical practice guidelines recommend classifying patients according to their health status in order to individualize the objectives of their treatment.³ However, the classifications currently used by some clinical practice guideline are empirical classifications, based on expert opinion (such as that of Caroline Blaum and colleagues⁴). For several years, it has been suggested that more research is needed in this area, in order to provide an evidence-based classification of health status and thus to develop clinically valid recommendations.⁵ The work proposed by Prof. Elbert Huang and colleagues is therefore greatly welcomed.

Nevertheless, we feel it is relevant to highlight a few additional aspects that could be useful for the further development of this work. First, it might be of interest to investigate further the functional status of patients within each class. Functional features are decisive in the individualization process, as recommended by current clinical practice guidelines.³ They may inform indeed the

decision making on the basis of issues that are of great importance for the patient. Of course, claims databases or large cohorts, such as those used in this study, generally do not include detailed data on functional status; and it is possible that the classification based on comorbidities as reported by Prof. Elbert Huang discriminates the functional status of patients, given the strong interactions between comorbidities and functional status.

Second, physicians treating a patient should be able to identify the class to which that patient belongs, that is, to do the reverse work of latent class analysis. As the authors mention in their article, the reclassification of an isolated individual cannot be done by means of a score, but must be done by using the post-probabilities generated by the classification model. We strongly suggest that this classification must be easy to use in the daily routine of healthcare providers, which is a *sine qua non* for its proper implementation.

Finally, most of the current guidelines only use explicitly the health status classification to set the appropriate treatment goals, whereas it could be interesting to use health status classification to determine the choice of glucose-lowering drugs as well. We should consider the development of an algorithm to plan the ideal treatment strategy for older patients with type 2 diabetes. For this purpose, it might be worth considering, at this stage, adding other aspects potentially relevant for the personalization of diabetes treatment to this health status classification. In particular, it has been suggested that frailty status or metabolic profile could possibly help to balance the individual risks and benefits, and thus inform the choice of the most appropriate treatment.^{6,7} As work in the field of frailty and diabetes develops,⁸ classifying patients according to their metabolic phenotypes may also guide the clinician to specific treatment pathways. This would be a practical alternative to a comprehensive personalized medicine approach until further research is undertaken.

In conclusion, the article by Prof. Elbert Huang and colleagues¹ provides a timely answer to a relevant question in relation to the individualized therapeutic management of type 2 diabetes in older patients. As we suggested above, we must await further research in the field of frailty and diabetes, and it is now necessary to coordinate efforts in order to consider the innovative use of this

data-driven classification of health status into daily clinical practice.

AUTHOR CONTRIBUTIONS

Antoine Christiaens and Alan J. Sinclair both drafted, wrote, and finalized this manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

SPONSOR'S ROLE

None.

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Reply to: Comment on: Data-driven classification of health status of older adults with diabetes: The diabetes and aging study

We greatly appreciate the comments from Drs. Christiaens and Sinclair regarding our manuscript describing our classification of older adults with diabetes based on comorbid

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conditions.¹ The ideal system of patient classification would incorporate all important dimensions of an older adult's health, predict future events, guide treatment decisions, and easily replicate across populations. We would be the first to admit that the classification system published