Editorial

Taxonomy of quantities

Xavier Fuentes-Arderiu

Laboratori Clínic, Hospital Universitari de Bellvitge, L'Hospitalet de Llobregat, Catalonia, Spain

Corresponding author: xfa@bellvitgehospital.cat

Abstract

The adjectives "generic", "subgeneric", "specific", and "individual" are proposed to be added to the term "quantity", depending on the case, in order to diminish the ambiguity of this term and to classify the different types of quantities.

Key words: quantity; nomenclature; terminology; taxonomy; property

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The definition of the concept 'quantity' given in the International vocabulary of metrology (VIM) (1) is "*property of a phenomenon, body, or substance, where the property has a magnitude that can be expressed as a number and a reference*". Surprisingly, this official definition (and the term "quantity") indistinctly refers to different, but very much related, concepts. These concepts have a different degree of ambiguity regarding the phenomenon, body, or substance to which the quantity under consideration belongs, as explained in the VIM. So, it can be said that anyone of the following concepts is a quantity:

a) amount-of-substance concentration;

b) amount-of-substance concentration of glucose;

c) amount-of-substance concentration of glucose in blood plasma; and

d) amount-of-substance concentration of glucose in blood plasma of a given person at a given time.

In order to diminish this ambiguity, I propose, in each case, to add to the term "quantity" an adjective clarifying the degree of ambiguity regarding the phenomenon, body, or substance (or the system, for brevity) owner of the quantity under consideration. According to this idea, in addition to the concept (and term) 'quantity' the following concepts (and terms), inspired in the Linnaean taxonomy, may be used:

a) 'generic quantity', to be used when neither a system nor one of its components are mentioned (e.g. amount-of-substance concentration);

b) 'subgeneric quantity', to be used when a component is mentioned but the system does not (e.g. glucose amount-of-substance concentration);

c) 'specific quantity', to be used when a system and one or more of its components are mentioned, but without spaciotemporal address (e.g. glucose amount-of-substance concentration in blood plasma);

d) 'individual quantity', to be used when a system, or a system and one or more of its components, are mentioned and spaciotemporaly addressed (e.g. glucose amount-of-substance concentration in blood plasma of a given person at a given time).

As individual properties are defined in time and space, they can really be measured. Contrarily, by their nature, generic, subgeneric, and specific quantities cannot be measured. It should be also highlighted that the term "generic quantity" is a superordinate of the terms "basic quantity", "de-

Table 1. Terms proposed here and elsewhere (4) compared.

This proposal (working term)	Other proposal (4) (systematic term)	Example
generic quantity	kind-of-quantity	mass concentration
subgeneric quantity	none proposed	mass concentration of protein
specific quantity	dedicated kind-of-quantity	mass concentration of protein in spinal fluid
individual quantity	instantiation of a dedicated kind-of-quantity	mass concentration of protein in spinal fluid of the patient X.Y. , today at 09:15

rived quantity", etc. used by the BIPM, ISO, and IUPAC, among others (1-3).

According to the classification proposed here, the portfolio of any clinical laboratory contains a list *specific quantities*, whereas the same clinical laboratory to express its production should take into account the *individual quantities* measured.

In the last decade another classification of quantities has been published (4). In this publication, the terms proposed probably are useful as systematic ones, but are too complicated and sophisticated (and difficult for translation to other languages) to be used as working terms. The equivalences between these systematic terms and the working terms proposed here are shown in Table 1.

Finally, it should be noted that all the proposals presented in this Editorial are applicable to the taxonomy of properties.

Potential conflict of interest

None declared.

References

1. *Joint Committee for Guides in Metrology. International vocabulary of metrology – Basic and general concepts and associated terms. JCGM 200:2012. Sèvres: Bureau International des Poids et Mesures; 2012. <www.bipm.org/utils/common/documents/jcgm/JCGM_200_2012.pdf>*
2. *International Organization for Standardization. Quantities and Units —Part 1: General. ISO 80000-1:2009. Geneva: ISO; 2009.*
3. *International Union for Pure and Applied Chemistry. Properties, units and symbols in physical chemistry ("Green Book"). Cambridge: Royal Society of Chemistry; 2007.*
4. *Dybkaer R. An ontology on property for physical, chemical, and biological systems. APMIS 2004; (Suppl.1–210). [Also available at http://ontology.iupac.org/ontology.pdf. Accessed July 2012]*