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The 'MOAHLFA(P) Index': An Attempt to Standardise a Widely Used Array of Descriptors of Patch-Tested Patients

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ABSTRACT

Background: Since its inception in 1980, the MOHL index (% patients who are male, have occupational, hand, or leg dermatitis, respectively) and its later evolutions until the presently used MOAHLFA(P) index (adding % patients with atopic dermatitis, face dermatitis, age 40+ years and positive reaction(s) to ≥1 baseline series allergen) have been intended to convey important demographic and clinical information on the patients patch tested in a certain area and time, aiding the interpretation of the observed spectrum of sensitisation.

Objectives: To examine the current usage of the MOAHLFA(P) index and suggest consolidated definitions for its single items.

Methods: A title/abstract search in Medline identified publications mentioning the evolving acronyms. A Delphi-like survey among contact dermatitis experts collected agreement with suggested definitions.

Results: The search term 'MOAHLFA' was used in 35 publications from a broad geographical origin. More than 80% of the 24 participants of the survey (65% response) agreed on maintaining to use (i) sex for the 'M' criterion, (ii) occupation-related dermatitis irrespective of medicolegal definitions for the 'O', (iii) atopic dermatitis (but not rhinitis or asthma) for the 'A'. The possibility to use more than one site among 'H', 'L' and 'F' and a more detailed description of age distribution were favoured, and the difficult interpretability of the 'P' measure was highlighted.

Conclusions: The 'classical' MOAHLFA(P) index may be extended. Some aspects, notably atopic dermatitis, need further standardisation.

1 | Introduction

It has long been recognised that the demographic and clinical characteristics of patch-tested patients have a profound impact on the spectrum and frequency of contact allergies diagnosed. This first led to the conception of the MOHL index by Wilkinson et al. in 1980 [1]. In this index, the 'M' stands for the proportion of male patients, 'O' for that of occupational cases, 'H' for hand eczema, and the 'L' characteristic included the share of patients with 'stasis eczema/leg ulcers'. This original 'index', as all its subsequent extensions, is an array of the prevalence of the respective patient characteristics for consecutively patch-tested patients. Thereby, an

index '40-20-60-5' would mean that 40% of the patients were male, 20% suffered were 'occupational cases', 60% suffered from hand dermatitis and a mere 5% from leg dermatitis. A few years later the MOHL index was extended to the MOAHL index by Andersen and Veien, the 'A' indicating the presence of atopic diseases ('personal rhinitis, asthma or atopic dermatitis—past or present') [2]. As a further extension, which has been widely accepted and used in the scientific literature on contact allergy, the characteristics 'face dermatitis' and 'age > 40' were added, arriving at the MOAHLFA index [3]. Most recently, it has been suggested to add the proportion of patients with positive reactions to at least one allergen of the baseline series as used in the department as the so-called 'P' measure to the index, that is, a MOAHLFA(P) index [4]; however, this suggestion has hitherto only partly been taken up. Putting the 'P' into parentheses within the acronym intends to imply a more optional use of the 'P' measure.

The motivation for using this ever-expanding set of descriptors has remained unchanged, namely, to give a summary of important patient characteristics, and thereby to enable a better interpretation of patch test results and comparison between consecutively patch-tested patients in different clinics. Furthermore, when patch test data are pooled from different clinics, statistical multifactorial techniques including the components of the MOAHLFA(P) index may be used to estimate the impact of these and other possibly important characteristics of the patients in the different clinics; an early example was offered by Christophersen et al. [5].

Such other, additional characteristics from a certain catchment area, like predominant industries, (fashion) habits, referral practices, or simply the region of the world, with different regulations of (certain) contact allergens, will have a strong impact on the spectrum of sensitisation among consecutively patch tested patients. Moreover, the simple age-dichotomisation will sometimes be too blunt to examine, for example, the trends of sensitisation following exposure changes, such as by nickel regulation. Anatomical sites beyond the three included in the MOAHLFA(P) index may sometimes be of interest to identify certain exposures associated with sensitisation. Hence, although undoubtedly important, MOAHLFA(P) characteristics are by no means an exhaustive description of patient features.

While some characteristics, most evidently sex and age, are quite straightforward to apply, others have been defined with slight variations. This leads to an inconsistency of reporting and relating to MOAHLFA(P) results. Therefore, we wish to provide, with the present document, (i) a full discussion of the variability found, along with arguments favouring a certain definition, which (ii) has been agreed upon by members of the European Environmental Contact Dermatitis Research Group (EECDRG) and the national representatives of the Council of the European Society of Contact Dermatitis (ESCD) taking part in a survey (see Acknowledgements section).

2 | Methods

With the aim of achieving an initial impression of the use of the above concepts, a literature search was performed in Medline using the following terms in the title or abstract (cut-off date 31 January 2024):

- 'MOHL', yielding 20 hits, none of them topical, that is, relating to the standardised description of demographic and clinical characteristics of patch-tested patients;
- 'MOAHL', yielding 4 hits, all topical [2, 3, 6, 7];
- 'MOAHLFA', yielding 35 hits, all topical [3, 4, 8–40];
- 'MOAHLFAP' or 'MOAHLFA(P)', yielding no results.

While the above references illustrate either methods development or application of the index in published research, selected additional references were retrieved as a basis for discussing recommendations for further specifying the definition of single aspects.

Draft conclusions, partly including alternative definitions, were compiled and offered to members of the EECDRG and the national representatives of the Council of the ESCD for expressing agreement or disagreement—or an equivocal opinion (Table 1). The survey was held from 1 to 31 December 2023, using a SoSci online documentation server. Results were retrieved and descriptively evaluated using the R statistical software (version 4.2.2, https://www.r-project.org).

3 | Results

The results of the survey, concerning the single items of the MOAHLFA(P) index, are shown in Table 1. The number of experts invited amounted to 37. These were invited via e-mail to participate in the survey. Of those invited, 24, that is, 64.9%, responded. All percentages reported in the following relate to this denominator of 24. Experience in dermatology/contact allergy research was up to 5 years in one, 6–15 years in two, and more than 15 years in 21 respondents.

As can be seen, very few items—namely, the 'H' and the 'F' (hand and face dermatitis)—received full consent. Still, a number of other definitions yielded agreement by at least around 80% of survey respondents. The more divergent results will be discussed below.

To add a qualitative aspect to the survey, free text comments were enabled, used by 8/24 respondents. Specifically, the following aspects were addressed by these:

- Regarding the question of whether sex or gender shall preferentially be used, one expert commented 'I am afraid that assessing "gender" in the patch test unit may be difficult or may raise concerns by the patients. Moreover, attribution to gender may have changed over time which may raise difficulties in interpretations of results'
- Another expert pointed out that leg ulcer patients are a 'distinct group of patients with increased risk of contact allergy because of their ulcer. Important to separate from patients with eczema on the legs'
- Concerning the dichotomisation of age at 40 years, an expert recommended 'we could try < 18 and above > 60 (or 65)—to discriminate paediatric and elderly'
- Finally, in more general terms, it was commented that 'many of these [items] require wider discussion to establish

TABLE 1 | Survey among EECDRG members and national representatives of the Council of the ESCD concerning practical use of the MOAHLFAP index (24 respondents, no missing data).

Item	*n* (%)
M: male: It is recommended to use gender in lieu of sex	
Agree	17 (70.8)
Do not agree (sex should be used)	5 (20.8)
Undecided	2 (8.3)
O: occupational dermatitis: It is recommended to consider 'work-related contact dermatitis' which is independent of legal definitions pertinent to 'occupational skin disease'	
Agree	21 (87.5)
Do not agree	3 (12.5)
Undecided	0 (0)
O: occupational dermatitis: It is recommended to consider not only contact dermatitis which is exclusively caused by occupational exposures, but also cases with a multifactorial background where occupational exposure is contributing to such an extent that without such exposure dermatitis would be substantially milder.	
Agree	16 (66.7)
Do not agree	3 (12.5)
Undecided	5 (20.8)
A: atopic dermatitis: It is recommended to consider atopic dermatitis according to established diagnostic criteria	
Agree	21 (87.5)
Do not agree (use 'atopy', i.e., Including asthma and/or rhinitis additionally)	3 (12.5)
Undecided	0 (0)
H: hand dermatitis: It is recommended that eczema/dermatitis affecting the whole hand(s) or parts thereof is considered	
Agree	24 (100)
Do not agree	0 (0)
Undecided	0 (0)
L: leg dermatitis: It is recommended that eczema/dermatitis affecting the lower leg(s), with or without ulcers or proven chronic venous insufficiency, is considered.	
Agree	19 (79.2)
Do not agree	4 (16.7)
Undecided	1 (4.2)
F: face dermatitis: It is recommended that the anterior surface of the head is regarded as the face	
Agree	24 (100)
Do not agree	0 (0)
Undecided	0 (0)
Concerning **H**, **L**, and **F**: It is recommended that the primary (initially affected) anatomical site of eczema/dermatitis is considered when determining *the most important* out of potentially more than one site (among hand, leg and face)	
Agree	17 (70.8)
Do not agree	4 (16.7)
Undecided	3 (12.5)

(Continues)

TABLE 1 | (Continued)

Item	*n* (%)
A: Age > = 40: It is recommended that the proportion of patients 40 years or older ('40+') years of age is considered	
Agree	13 (54.2)
Do not agree (i) (another age representing better the internationally observed age median of patch-tested patients should be used instead; suggested is ...[a] years of age)	1 (4.2)
Do not agree (ii) (another age representing better the internationally observed age median of patch-tested patients should be used in addition to the conventional age threshold and the decision be made after evaluating comparative results after a sufficient period of time; suggested is...[a] years of age)	2 (8.3)
Undecided	8 (33.3)
P: proportion of patients positive to at least one baseline series allergen: It is recommended to determine the percentage of patients positive to at least one baseline series allergen as used in the department and, at the same time, report on the set of allergens included in this	
Agree	16 (66.7)
Do not agree	3 (12.5)
Undecided	5 (20.8)

[a]Alternative cutpoints were indicated by 4 respondents: 17 ($n = 1$), 40 ($n = 1$), and 50 ($n = 2$).

what the current purpose is—I suspect that this may have changed with time'

4 | Discussion

The references identified using the above gross search strategy illustrate that the MOAHLFA index, but not the MOAHLFA(P) index, has gained popularity across different countries, author groups and journals. The relatively small number of 35 publications can, in this case, be regarded as just the 'tip of the iceberg', as many other publications have used the concept and presented the respective results in text or tables, but did not mention this in the abstract or even title. Thus, the actual degree of adoption is underestimated. Notwithstanding, based on the above set of publications and other literature, some observations on use can be made. These will be discussed in combination with results and possible implications of the survey, characteristic by characteristic, in the following.

4.1 | M for Male

Since the inception of the MOHL index some 40 years ago, connotations of (male) gender have greatly changed in many societies, in contrast to 'biological' sex. This raises the question of whether sex or gender, in this case male, should be captured in the documentation as a rather crude exposure surrogate rather than for the purposes of gender-sensitive medicine. Concerning definitions of both, the World Health Organisation proposes that sex refers to 'the different biological and physiological characteristics of males and females, such as reproductive organs, chromosomes, hormones and so on'. Gender refers to 'the socially constructed characteristics of women and men—such as norms, roles and relationships of and between groups of women and men. It varies from society to society and can change ...' (https://www.coe.int/en/web/gender-matters/sex-and-gender, last accessed 2 February 2024).

As strictly biological differences in reactivity to haptens have not been unequivocally proven, and exposure is driven probably more by gender than by sex, the application of 'gender' would appear more relevant. As an obstacle, there are some languages that do not have a word for 'gender'. In such cases, the word 'sex' is normally used, and to distinguish between sex and gender, different terms may be employed, for example, 'biological sex' may be used to refer to 'sex', and 'cultural and social sex' may be used to refer to 'gender' (https://www.coe.int/en/web/gender-matters/sex-and-gender, last accessed 2 February 2024). Thus, it may be difficult to advocate the use of gender in lieu of sex, also including inter-cultural differences in gender concepts, or changes across time, when targeting the global applicability of the MOAHLFA(P) index. The difficulty to obtain information on gender in the context of a patch test clinic as mentioned by one survey respondent may be another reason to stay with the use of 'biological' sex. Such difficulties are indicated by the present survey results, which indicate that a majority would indeed use gender in lieu of sex, but this was not substantial enough to meet our threshold criterion of ~80% approval. Hence, in conclusion, no change in the traditional definition using sex is foreseen—individually and interactively defining sex in the case of transgender or non-binary patients. These patients with 'diverse' or 'other' sex would,

along with females, constitute the opposite quantity to males. Still, the present discussion is put into some perspective by the presumed rarity of cases in whom gender and sex would be different, or sex would be non-binary.

4.2 | O for Occupational Dermatitis

The concept 'occupational dermatitis' faces several potential difficulties in its definition. First of all, 'work-related' contact dermatitis can be considered, or contact dermatitis in terms of an 'occupational skin disease'. The former refers to any type of contact dermatitis which is caused (to some important extent, see below) by occupation-related exposures, the latter includes formal definitions depending on the legal background of a country, which may vary considerably between countries [41]. Patients with 'occupational skin disease' (in terms of contact dermatitis) are therefore a subgroup of patients with 'work-related contact dermatitis'. According to our literature review, no specific definition of either a stricter or broader definition of the 'O' measure has been reported by studies using the MOAHLFA(P) index. Slightly varying phrasing had been used in the literature, such as 'occupational dermatitis', 'occupational', 'occupation', 'occupational case(s)'. One study from Israel mentioned the MOAHLFA(P) index but replaced the 'O' with 'T' for trunk involvement owing to a complete lack of occupational dermatitis cases [14]. The survey results clearly favour the use of work-relatedness of contact dermatitis (and not a legally defined occupational skin disease) as defining the 'O' factor.

The diagnosis of work-relatedness should be made after completion of patch testing and ideally based on possible re-assessment of the role of occupational exposures in the light of collected patch test results. It is straightforward if work exposure is the only cause of contact dermatitis, or at least the predominant cause, which may be true in a considerable proportion of cases. However, in other cases, aetiology may be mixed in the sense that also non-occupational factors, such as household or leisure exposure to contact allergens or irritants also present at the workplace, or sensitivity to irritation as in atopic skin contribute to dermatitis. In such cases, partial occupational causation can be an adequate classification of work-relatedness—this can, however, probably not be regarded as equivalent to the clear and mostly exclusive work-relatedness discussed above. Moreover, judgement on the significance of 'non-exclusive' occupational exposures will be of variable quality and subjective to some extent, even if, for example, some standardised algorithm for arriving at a conclusion is employed. Accordingly, one-third of survey participants were hesitant to adopt the notion of including such 'partial' work-relatedness into the definition of the 'O' factor. In conclusion, an unequivocal affirmation of the 'O' criterion should be employed only in patients whose dermatitis is exclusively or predominantly caused by occupational exposure.

Referring to the original broad definition as 'occupational cases' from Wilkinson et al. [1], it may be argued that these are not necessarily restricted to 'occupational dermatitis'—the definition used in the subsequent publications by Andersen and Veien [2] and Schnuch et al. [3]—but could include non-dermatitis occupational skin disease as well. However, as de facto standard definition, a post-patch testing evaluation would evaluate only patients with contact dermatitis, allergic or irritant, as potentially eligible for being classified as 'O'.

Nonetheless, separate documentation of categories of 'partial' occupational causation, ideally following a clear definition, as well as information on the share and nature of non-dermatitis diagnoses such as occupationally aggravated palmar psoriasis, and their separate consideration in data analysis can be useful, particularly in analyses and publications focusing on work-related contact allergy.

4.3 | A for Atopic Dermatitis (Atopy)

The initial definition of the first 'A' included the personal history of all atopic diseases [2], whereas with the introduction of the MOAHLFA index, only atopic dermatitis (AD), but not rhinitis or bronchial asthma was considered defining the 'A' factor [3]. Consequently, the few publications until 1997 include, for example, 'atopic disease' [5]. Since then, use has just been specified as 'atopic', possibly including, for example, rhinitis or asthma [8]. Citing the Schnuch et al. paper as (sole) reference would raise the expectation that AD only has been employed as defining this 'A'; however, explicit reference to this fact was lacking.

Actual discussion of whether and why atopy in general, for example, owing to a general Th2 skewing of the immune response that may favour reactivity to contact allergens that seem to be more dependent on a Th2 response, namely fragrances and chloromethylisothiazolinone/methylisothiazolinoe [42, 43], or just AD, in view of the evident role of skin inflammation, epidermal barrier disruption, and particular exposures, should be considered important regarding the spectrum and frequency of contact allergy has hitherto been scarce, including in the initial introduction by Schnuch et al. [3] The survey participants generally favoured to consider only a personal history of AD, but 3/24 wished to also consider rhinitis or bronchial asthma (Table 1). In conclusion, in terms of consensus, there was strong, but not perfect agreement to consider AD only, in view of the pronounced importance of atopic dermatitis characteristics on the general and certainly the specific (treatment-related) sensitisation spectrum. Nevertheless, further research into the role of general characteristics of atopy also found in rhinitis and/or asthma patients may lead to a reconsideration of this notion.

Thus, focusing further on AD, two issues arise in the definition:

- Should only previous AD be considered, including during childhood, which may have disappeared for a long time, or also a current (additional) diagnosis of AD, in an adult consulting with suspected contact allergy? As the 'A' criterion should capture the physiological (epidermal barrier), immunological (TH2 skewing), and some exposure-related impact of AD, it is suggested to consider both, current and previous, AD. If feasible and important to the particular research topic of an analysis, current and previous AD could be stratified for.
- Which definition of AD should then be used? Regarding the physician's diagnosis of current or previous AD, some

cases of AD may be easy to diagnose at first sight—possibly more in a general clinic than in a patch test clinic where the more complex cases may be seen. Trying to support a more standardised diagnosis, Hanifin suggested a set of essential, major and minor criteria [44], later condensed to the well-known and widely used major and minor criteria [45]. A slightly different approach of weighting different criteria for the clinical diagnosis of AD was followed by Svensson et al. [46] and Diepgen et al. [47] arriving at a score making 'atopy' or 'atopic skin diathesis' a likely, possible, or unlikely diagnosis. Focussed on paediatric assessment, the UK working party elaborated, and validated, a set of widely used criteria for AD [48]. The 'UK working party' criteria are also employed for adults, with; however, hitherto lacking validation of diagnostic properties (e.g., compared with the above-mentioned criteria). A significant problem among adults is recall bias regarding previous AD [49]. A slightly modified version of the 'UK working party' criteria was used in the Danish 'Health2006' study, namely, an itchy skin condition as a major criterion, plus a minimum of four minor criteria (i) history of involvement of the skin creases, (ii) a history of asthma or hay fever, (iii) a history of generally dry skin and (iv) onset before age 2 years [50, 51]. Moreover, previous AD has been operationally defined as an affirmative answer to the question 'Have you ever had an itchy skin condition that occurred on and off for at least 6 months and sometimes was localised in the skin folds?' [52]. These examples used in (clinical) epidemiology, certainly not exhaustive, illustrate that a great abundance of such definitions exists. Future efforts toward standardisation should arrive at an AD definition that is both feasible and generally accepted in a clinical (patch testing) setting. For the time being, the definition as used locally, or the definitions, possibly varying, in multicentre studies, should be mentioned and referenced, respectively.

4.4 | H for Hand Dermatitis, L for Leg Dermatitis and F for Face Dermatitis

While the definition of the 'H' and the 'F' has unanimously been accepted (and is probably somewhat trivial), the 'L' for leg dermatitis as suggested, using a broad definition including the existence of leg ulcers has achieved 19/24 (79.2%) agreement, with one participant being undecided, that is, just missed the chosen (arbitrary) threshold criterion of 80%. In fact, 4/24 survey participants were explicitly against such inclusion; the special significance of venous ulceration had been mentioned as a special comment. The existence of leg ulcers can be regarded as a complication of (untreated) venous disease which also gives rise to stasis dermatitis [53]. Following this notion, leg ulcer patients would very often represent a more severely affected subset of stasis dermatitis patients. Thus, there is mostly a continuity in underlying conditioning factors such as pre-existing skin inflammation and compromised epidermal barrier—the latter evidently entirely absent in case of ulceration, thereby drastically increasing sensitisation risk, also exposing the patient to a broad range of leg ulcer topical treatments entailing their own risk additional of contact allergy [54]. Of note, the initial definition was that of 'Leg ulcers/stasis eczema' [1]. It may thus be assumed that the MOAHLFA(P) index as used up to date will have employed the broader definition, which would favour continuation of such definition. Ideally, additional information on the share of leg ulcer patients in the patient sample should be given, especially if and possibly even further such stratification is meaningful.

Generally, a potential problem arises if, among these three selected body regions, more than one is affected, like sometimes, hands and face. While this has not explicitly been addressed in the publications which can be regarded as key references [1–3], it has been standard practice in the IVDK and ESSCA networks to include just one site per patient when the MOAHLFA(P) index is reported—preferentially the primary site of contact dermatitis, that is, where contact dermatitis leading to the present consultation began before possibly spreading. In those cases where multiple primary sites have been affected, a judicious decision should be made. Alternatively, and closer to clinical reality, the 'HLF' factors could be used as multiple, not single-choice items. Consensus regarding this aspect has not been reached in the present survey, with 4 voting against a single choice and 3 (of 24) being undecided. Consequently, it can be recommended to use either variant, but to report on whether single or multiple choice is employed, and ideally to quantify the overlap between the three anatomical sites along with multiple choice use.

Independently, sites other than hand, leg and face may be affected, and this may be regarded as interesting information beyond the MOAHLFA(P) index. For example, in the ESSCA analysis of 2013/2014 data, the overall proportion of patients with dermatitis of the trunk was 7.4%, and with generalised dermatitis 9.1% [55].

4.5 | A for Age (40+)

Regarding age-dichotomisation, there is a little inconsistency in usage. Schnuch et al. initially suggested 'age >40 years' [3], whereas later, mostly 'age ≥ 40' (i.e., 'age 40+') was employed. The effect of a 1-year difference on this 'A' prevalence is probably marginal, but it appears unnecessary to continue using a slightly varying definition. The present survey is somewhat inconclusive with regard to the age threshold used for dichotomisation, with just 13/24 in favour of the '40+' threshold, and 8/24 undecided. If, boldly, the undecidedness is taken to support the status quo, the '40+' threshold may probably remain in place, also given the fact that in the past decades, this very categorisation had been used, and thus the results presented, including age- and sex-standardised sensitisation prevalences, will remain comparable if using the conventional cut-off.

Irrespective of such discrepancies, some studies illustrated the importance of using the MOAHLFA(P) index by performing trend analyses of the MOAHLFA(P) factors and finding marked changes in some of these factors, most notably age [8, 9, 15]. Given the strong association of many contact allergies with age—well-known for fragrances [56, 57]—such observations strengthen the notion of a need to consider, in some way, varying age-distributions both when analysing patch test results of different departments with possibly differing age distributions among their patients and time trends of contact

allergies. The most basic way would be to just descriptively present the departmental differences and the development of the MOAHLFA(P) index across the same years a contact allergy trend is presented, respectively. A more elaborate approach would be age-standardisation of these prevalences, although using the dichotomised 'Age 40+' versus 'Age < 40' as standardisation factor to this end is somewhat crude and will not achieve full adjustment for the age-gradient ranging well into age 80+ [56, 57].

The fact that in the IVDK the share of patients age 40 years or older has steadily increased, arriving at 72.1% in the last published results [58], may indicate that in the rather vast majority of 'old' patients, much age-relatedness is not addressed when using this for standardisation purposes. While this would call for an increase of the age-cutoff, for example, around the present median, the ensuing results would not be comparable with the previously used age-standardisation. Coming back to the simpler task to present the demographic and clinical characteristics of patch-tested patients, it may be advisable to present more detailed information on age distribution anyway, for example, the quartiles or quintiles. The identification of distinct age-specific sensitisation patterns for different contact allergens [59] additionally supports the use of a finer age-stratification, where possible. Mean and standard deviation are not advisable, as most age distributions in this context are skewed or multimodal.

4.6 | P for Proportion With Positive Reaction(s) to Baseline Series Allergens

The 'P' measure is the latest suggested addition to the MOAHLFA(P) index [4]. It is motivated by the notion that the selectivity of patch testing, that is, whether patients are liberally or more restrictively referred to the patch test clinic, 'consecutively' appearing there, will affect the contact sensitisation prevalences to single allergens found in the respective group of patients. This assumes that with more restrictive access to patch testing, a higher a priori likelihood of diagnosing any contact allergy will result. A full discussion is found in [4]. Following this notion, a high proportion of patients with at least one positive reaction to an allergen included in the baseline series would put a high prevalence observed to every single allergen into perspective to some extent. However, difficulties arise by varying composition of baseline series in use:

- The baseline series tested in different departments (even within one country) may not be identical, both in terms of length and composition. Therefore the a priori likelihood of diagnosing any contact allergy will vary by virtue of these differences alone.
- If this problem is circumvented by considering only allergens of the European Baseline Series (EBS) in the version valid at the time patch test data have been obtained, deliberate omissions in departments and countries, respectively, which are not uncommon, will bias the overall yield downwards in those. As one such example, the German Contact Dermatitis Research Group (DKG), for example, excluded neomycin sulphate many years ago owing to very limited exposure to it in Germany, never included textile dye mix and used methylisothiazolinone 0.05% aqueous instead of 0.2% aqueous for regulatory reasons. This will lower a priori the 'P' measure compared with testing with the full EBS [60].

Perhaps owing to such interpretational difficulties, approval to use the 'P' measure was expressed by two-thirds of survey participants. In light of factors making the 'P' more comparable between departments—mainly the use of the same baseline series—the 'P' measure may be most suitable to national contact dermatitis networks, and less so for international comparisons. Besides indicating the 'selectivity' of patch testing—useful, in principle, for the interpretation of patch test results—the 'P' measure could also regarded as reflecting the efficiency of the baseline series in use. Following this line of thought further, it may be advisable to use a 'P' measure indicating the share not of all positive baseline series reactions, but only of those clinically relevant, to address the actual diagnostic value of the test series. Moreover, other measures may be used for quantifying the selectivity of patch testing, such as the reason for patch testing (e.g., the proportion of suspected contact allergy vs. the proportion of patients patch tested to exclude contact allergy).

5 | Conclusion

While most, if not all, will agree to the objective of standardising the MOAHLFA(P) index further, the actual implications, that is changing (e.g., age dichotomisation) or sharpening (criteria for AD) definitions, are probably more difficult to address and also controversial, because changes will render future MOAHLFA(P) results difficult to compare with previous MOAHLFA(P) results. At the same time, useful as it is, the index is not a 'one-size-fits-all' solution for describing a group of consecutively patch-tested patients—rather a minimum standard. Further characteristics, or refinements of the 'O' and the 'L' factors and age representation as suggested above, may be useful to convey a clearer picture of the consecutive patients undergoing patch testing.

Author Contributions

Wolfgang Uter: conceptualization, methodology, software, data curation, formal analysis, visualization, writing – original draft, writing – review and editing, project administration, resources. **Klaus Ejner Andersen:** methodology, writing – original draft, writing – review and editing. **Richard Brans:** methodology, writing – review and editing, writing – original draft. **Magnus Bruze:** methodology, writing – review and editing. **Steffen Schubert:** writing – review and editing, writing – original draft, methodology. **Margarida Gonçalo:** writing – original draft, writing – review and editing, methodology, investigation, conceptualization.

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Conflicts of Interest

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