



VithoulkasCompass  
HOMEOPATHY SOFTWARE

Research Bulletin No.4

June 2019

**Excellence in homeopathic practice, using science,  
large-scale evidence and state-of-the-art technology.**

Shaping the future  
of homeopathy software:  
new methodologies  
and expert tools

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Our vision:

# Reliable, evidence-based homeopathy

Dear fellow homeopaths and friends of homeopathy,

With great pleasure we are introducing the 4th Vithoukias Compass Research Bulletin and with it, some new important innovations in homeopathic software development. The driving force behind this work has been, as always, our growing community of users and its success with VC, along with our guiding principle of **building on what works in homeopathy**, using real-world data. Our projects are focused into supporting everyday classical homeopathic practice by developing tools and systems that make it more successful and evidence-based, as well as more efficient. In a time where homeopathy faces challenges to provide more scientific data, practitioners using VC can make a significant and positive contribution to its evidence base, and at the same time be optimally supported in successful prescribing. The internet, combined with cutting-edge, and secure, 'cloud-based' platforms ushers us in a new era of 'big data' gathering and analysis with unprecedented possibilities for R&D.

Since our last Research Bulletin, the Vithoukias Compass team has been intensively working on new developments. Multidisciplinary project teams consisting of medical doctors, homeopathic practitioners, computer scientists, mathematicians, university researchers, technology experts as well as external experts have been continuously engaged in several different areas of possible innovation and improvement.

An important project has been the calculation of evidence-based parameters for the reliability and the usefulness of rubrics. Based on the latest updated VC case analyses set (which now stands at around 700,000 discrete analyses), metrics for the usage and relative effectiveness of every rubric can be produced. For the first time, there is a clear indication of how useful and reliable every rubric is. This information is useful for the homeopath as well as for the differential analysis modules of VC, which can become more selective when proposing differential symptoms. We are testing different methods of incorporating it in the software.

As mentioned in previous Research Bulletins, an ongoing repertory research topic is the calculation of likelihood ratios of rubric-remedy pairs, which we increasingly incorporate into the VC knowledge base and remedy differentiating algorithms. Furthermore, we have started to look at more advanced evidence-based parameters of remedy scoring, notably the Likelihood Ratios of combinations of symptoms used in case-taking. The new-evidence parameters are incorporated in the repertory-based algorithms which are also being enriched with new ideas. As always, every new experimental version of the VC 'brain' is benchmarked applying a growing reference set of real world cases for which the prescribed remedy was clearly effective. With more data becoming available this methodology will enable us to assess and further validate remedy 'pictures', bringing us even closer to what homeopaths require in daily practice. The two projects above are effectively putting valuable collective experience in the hands of VC users and we are confident that this will make a world of difference.

Another important area of work is the implementation of a new more functional structure of the repertory. The concept of Thematic Entities has been developed, where rubrics belonging to a common case-taking theme are grouped together. As we explain in the relevant chapter, the new structure facilitates easy access to and comparison of thematically related rubrics and can also provide theme-based pictures of remedies, very similar to a process that most homeopaths mentally perform. This enables a more precise remedy differentiation and enhances the study of remedies. In addition, it supports the continuous development of the thematic entities and the addition of important concepts relate to themes in homeopathic analysis coming from experienced homeopaths. The new structure is coming hand

in hand with another powerful tool, soon available, the VC Rubrics Analysis tool. It can produce a deep analysis report on any set of rubrics, highlighting the ones most relevant to thematically related remedies, those most consistently present, as well as the local keynote symptoms of the thematic entity. We are very enthusiastic about this new 'brain' within VC. It will be a reliable and lightning-fast companion for repertory analysis, practice and research. There are other areas of R&D in which our team is working. Two notable ones are psychometric testing and the study of biases in case-taking, and there are relevant chapters in this bulletin which provide more information on these very interesting topics.

The VC Team always values and utilizes user support and feedback. All developed tools within VC are continuously being improved through analysis of real cases and user feedback. The VC application uses innovative cloud based technology that offers unprecedented possibilities for multiple access and collaborations.

VC also highly values security. We took all the necessary measures and precautions to ensure that data are protected from any possible threat, and compliant with the international General Data Protection Regulation (GDPR) guidelines. We have a multilevel architecture, which has proven to be safe under several penetration tests conducted by independent organizations. The anonymity of patient data is safeguarded by protection and encryption in accordance with the latest industry standards. The VC Analysis team does not have access to patient or doctor identification data.

**CHOES LTD.**, the legal entity that develops Vithoulkas Compass' platform, through its R&D Team, aims to continue facilitating international cooperation such as:

- A collaboration with LMHI and the initiative for High Quality Clinical case collection. Homeopathic practitioners are encouraged to send clinical case through a special submission form. The cases will be evaluated by an independent Scientific Committee and the participants with the best two cases will be offered the opportunity to present these cases during the 74th LMHI World Congress of Homeopathy which will take place in Italy in September 2019.
- Collaboration with the Central Council of Research in Homeopathy of the Ministry of AYUSH in India. Since May 2018, the VC team has been offering its platform to CCRH researchers for the collection of high quality documented cases for publications and to provide evidence for homeopathy. In less than a year, already more than 2000 cases were collected.
- Collaboration with the Homeopathic Pharmacopoeia of the United States (HPUS). HPUS, by taking data from VC, conducted a study about the validation of provings in Homeopathy.
- The VC Team is also represented in the Research Subcommittee of the European Committee of Homeopathy (ECH) where researchers from the homeopathic community meet at least twice a year to exchange ideas and get informed about the latest developments in research in homeopathy.

Our mission is to assist in the recognition of the value of homeopathy to help achieving better overall health in society. We continue our focused effort inspired by the work of Professor George Vithoulkas and we are confident that our initiative will be of benefit for all members of the homeopathic community and patients worldwide that seek homeopathic treatment. We hope that this Bulletin will be of value and, as always, we are open to opinions, discussions and collaborations.

Kyriakos Xagoraris (Managing Director of CHOES Ltd) - June 2019

## A. Analysing clinical cases

VC, designed to be online, has the capability to collect anonymous data from the homeopathic practitioners that use the platform. The analyses were based on more than 225.000 prescriptions episodes collected from 2014 to 2018. A “prescription episode” is defined and considered complete when the homeopath prescribes a single homeopathy remedy, which is followed after the proper period of time by an assessment of its effects.

## Descriptive results of analyses

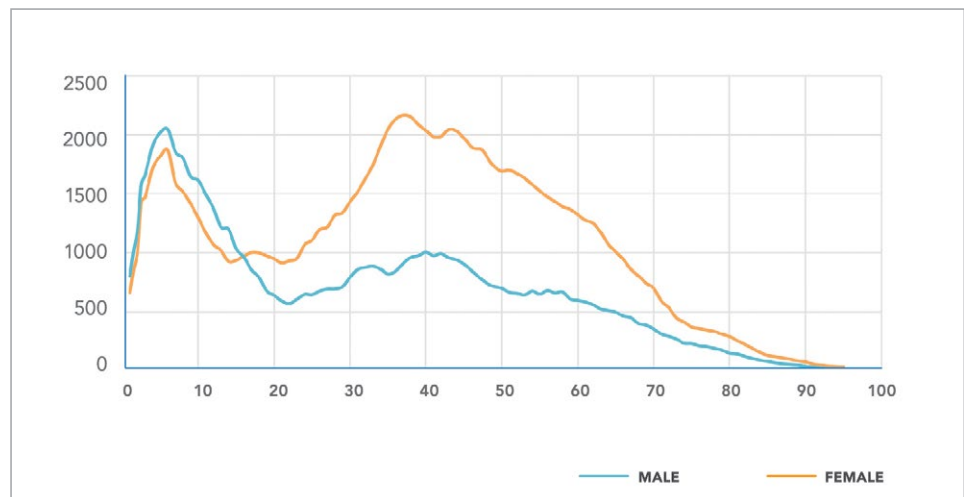


Figure 1: Age distribution of the patients, stratified by gender.

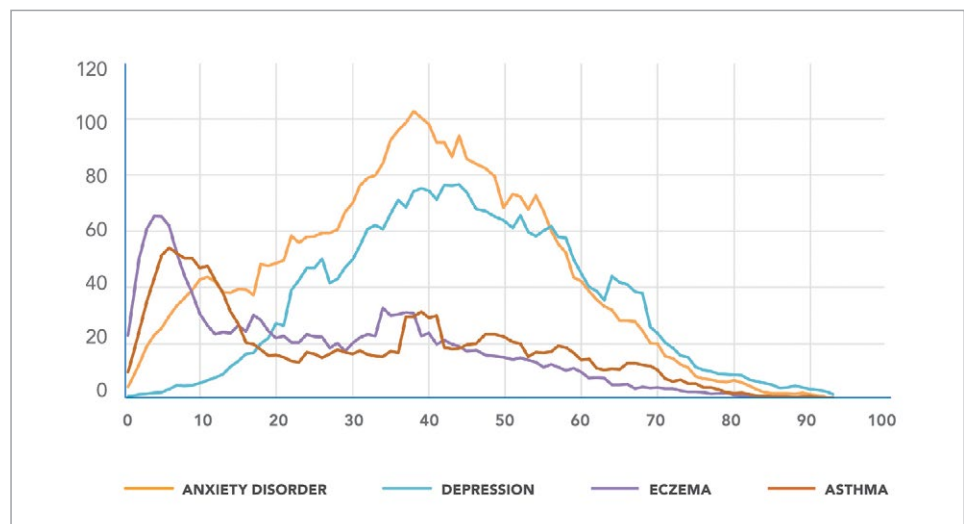


Figure 2: Age distribution of patients stratified by some of the most common pathologies.

# Geographical distribution of the most commonly prescribed remedies

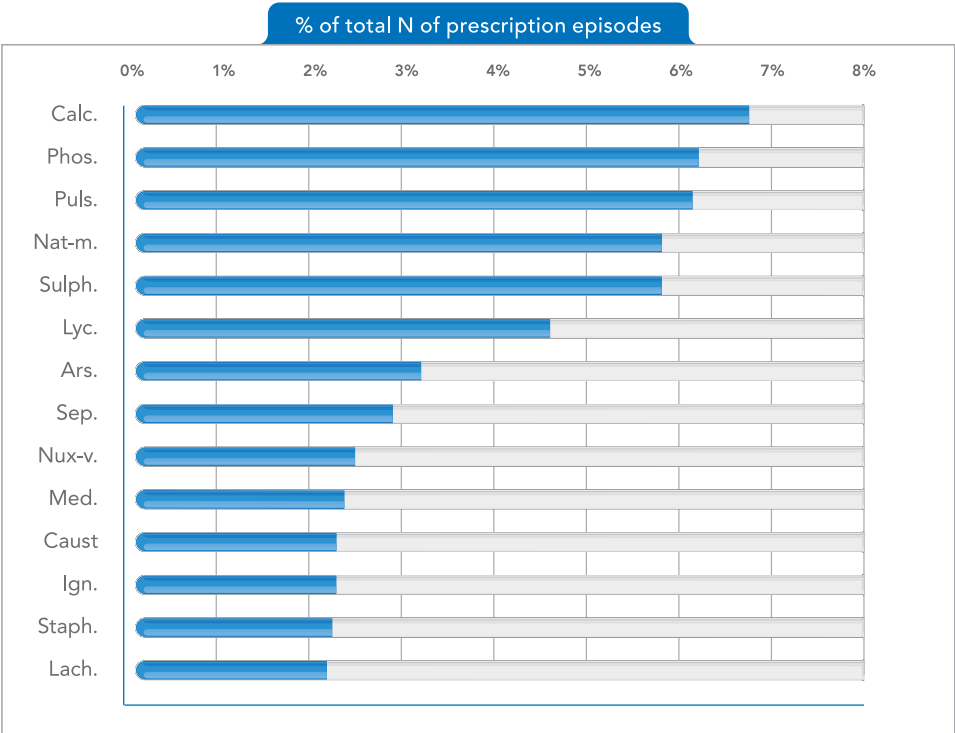
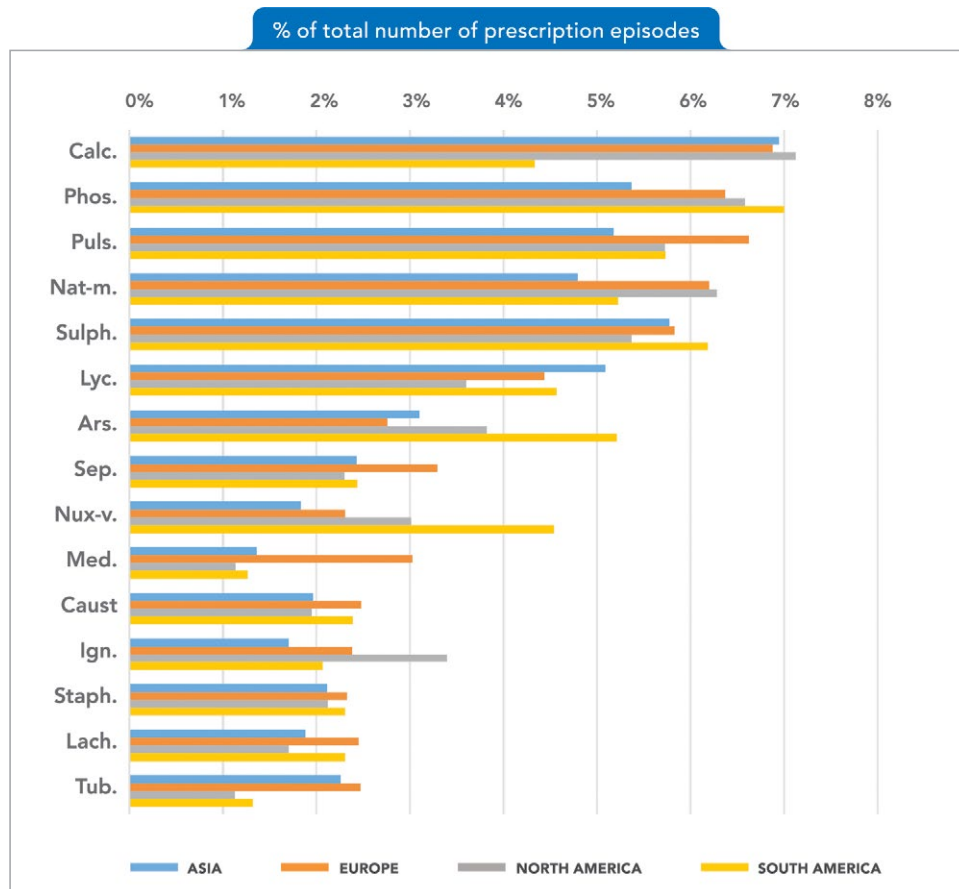


Figure 3: Commonly prescribed remedies as a percentage of the total number of prescription episodes.

Remedies	Asia	Europe	North America	South America	Grand Total
Calc.	6,9%	6,9%	7,1%	4,3%	6,8%
Phos.	5,4%	6,4%	6,6%	7,0%	6,2%
Puls.	5,2%	6,6%	5,7%	5,7%	6,1%
Nat-m.	4,8%	6,2%	6,3%	5,2%	5,8%
Sulph.	5,8%	5,8%	5,4%	6,2%	5,8%
Lyc.	5,1%	4,4%	3,6%	4,6%	4,5%
Ars.	3,1%	2,8%	3,8%	5,2%	3,1%
Sep.	2,4%	3,3%	2,3%	2,4%	2,9%
Nux-v.	1,8%	2,3%	3,0%	4,5%	2,4%
Med.	1,4%	3,0%	1,1%	1,3%	2,3%
Caust.	2,0%	2,5%	1,9%	2,4%	2,3%
Ign.	1,7%	2,4%	3,4%	2,1%	2,3%
Staph.	2,1%	2,3%	2,1%	2,3%	2,3%
Lach.	1,9%	2,5%	1,7%	2,3%	2,2%
Tub.	2,3%	2,5%	1,1%	1,3%	2,2%

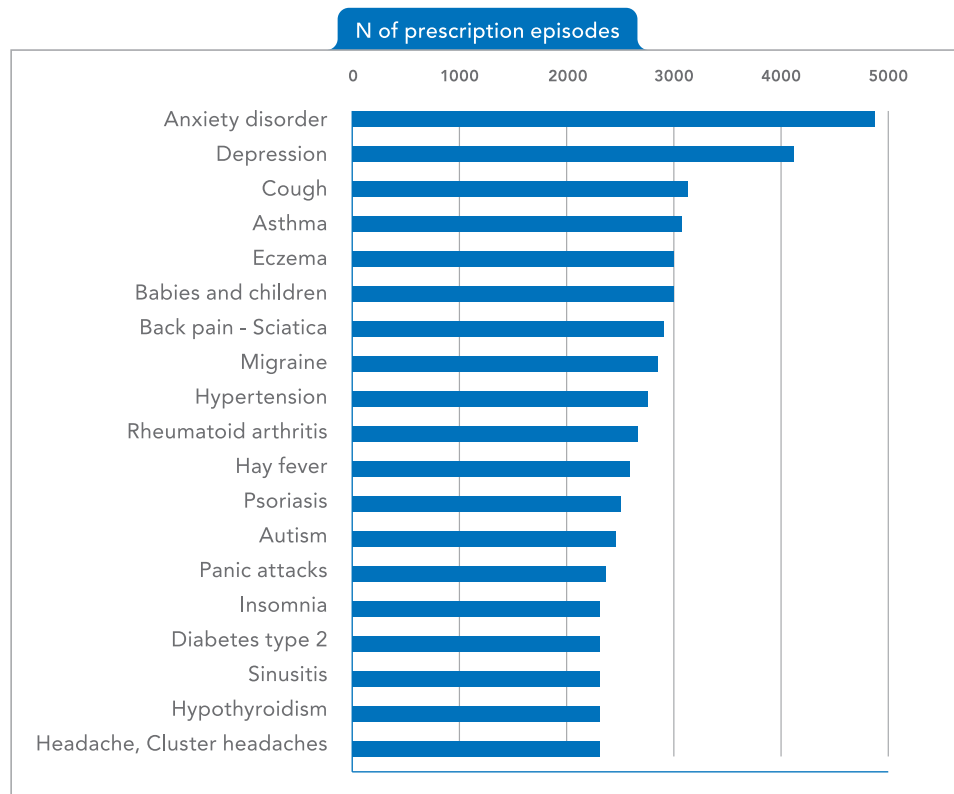
Table A: The percentage of the most commonly prescribed remedies by geographical region

Figure 4: Commonly prescribed remedies, stratified by geographic regions



## Prevailing Pathologies

Figure 5:  
Most commonly treated conditions, as reported by the practitioners





## Prevailing Pathologies

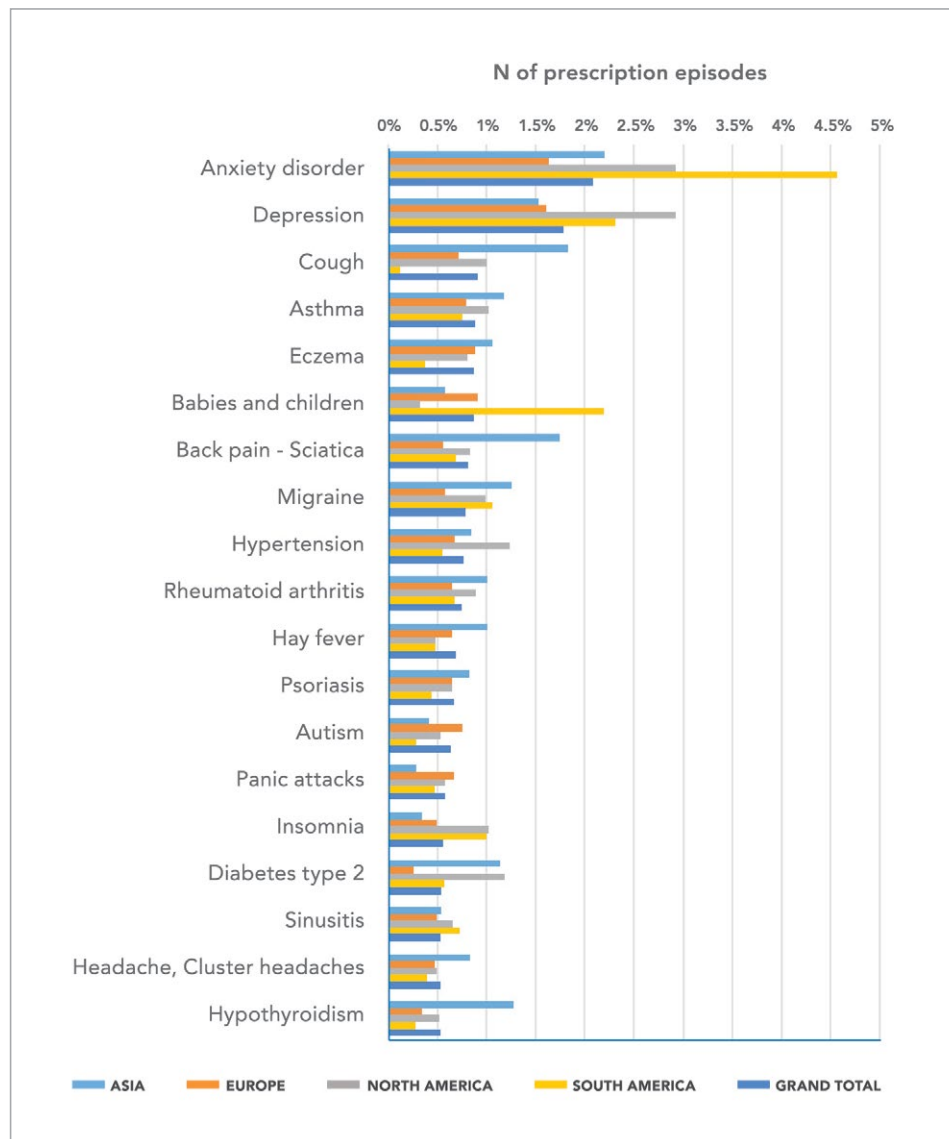


Figure 6:  
Most commonly treated conditions, as a percentage of the total number of prescription episodes, stratified by geographical regions

Figure 7:  
Remedies used in some  
commonly treated conditions,  
as a percentage of the total  
number of prescription  
episodes in that condition

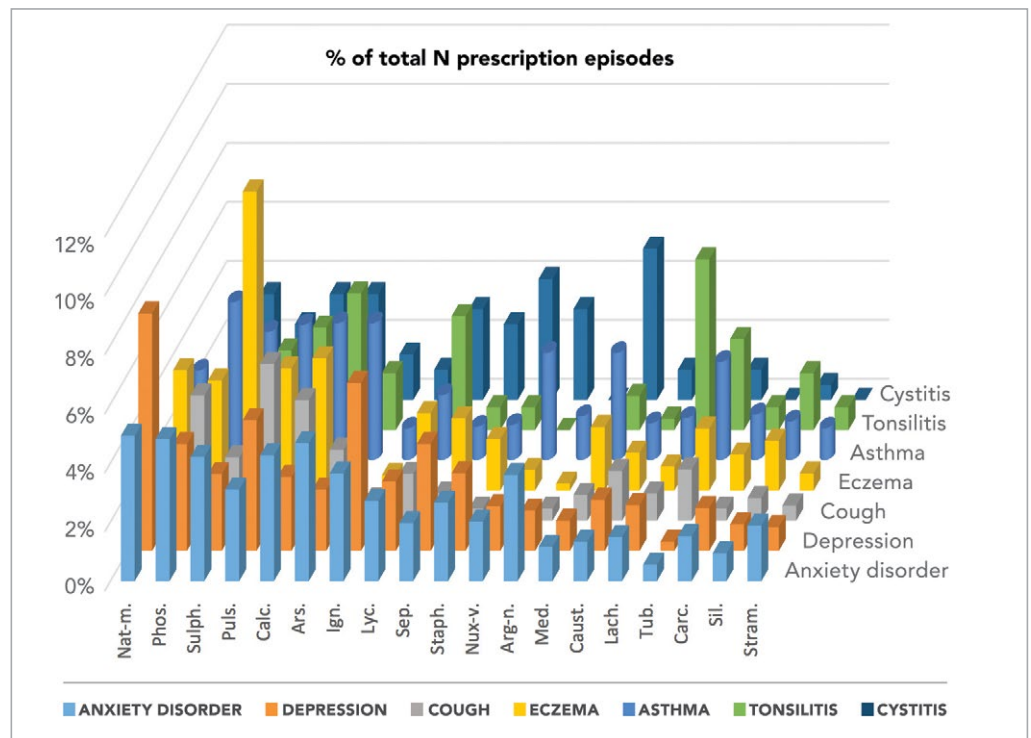
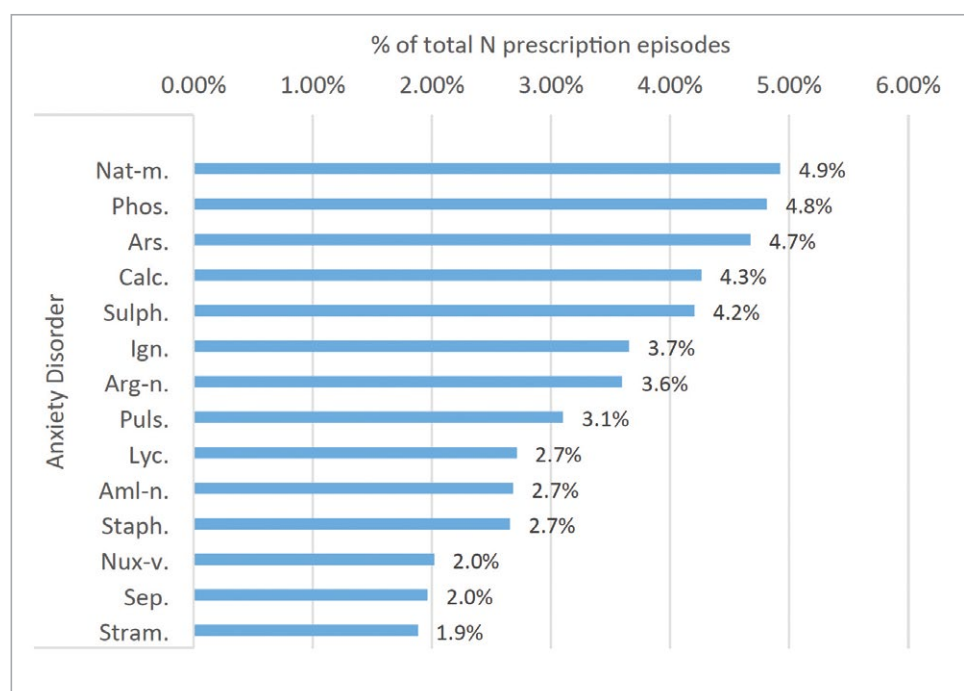


Figure 8:  
Most common remedies  
used for Anxiety disorders



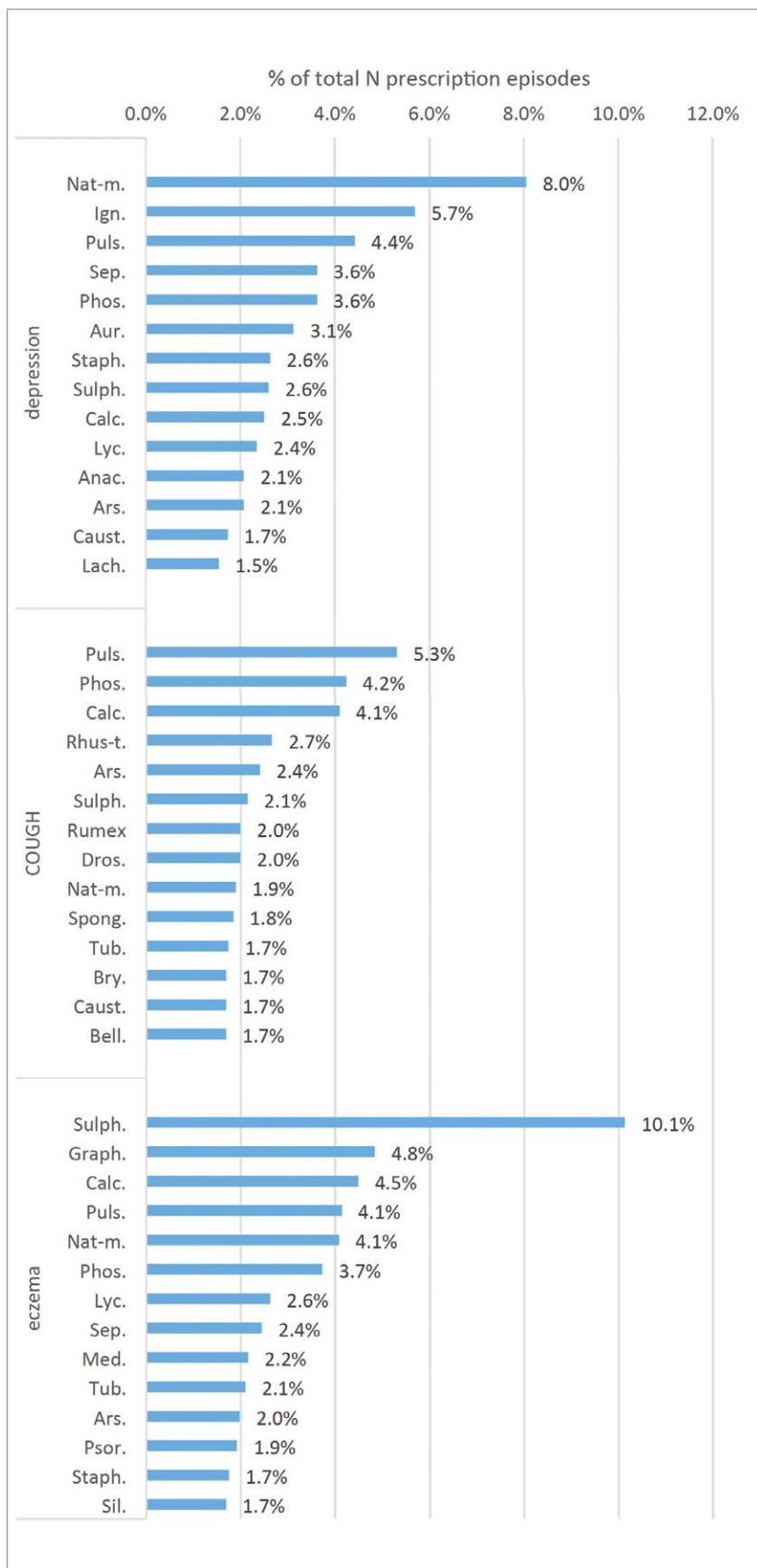
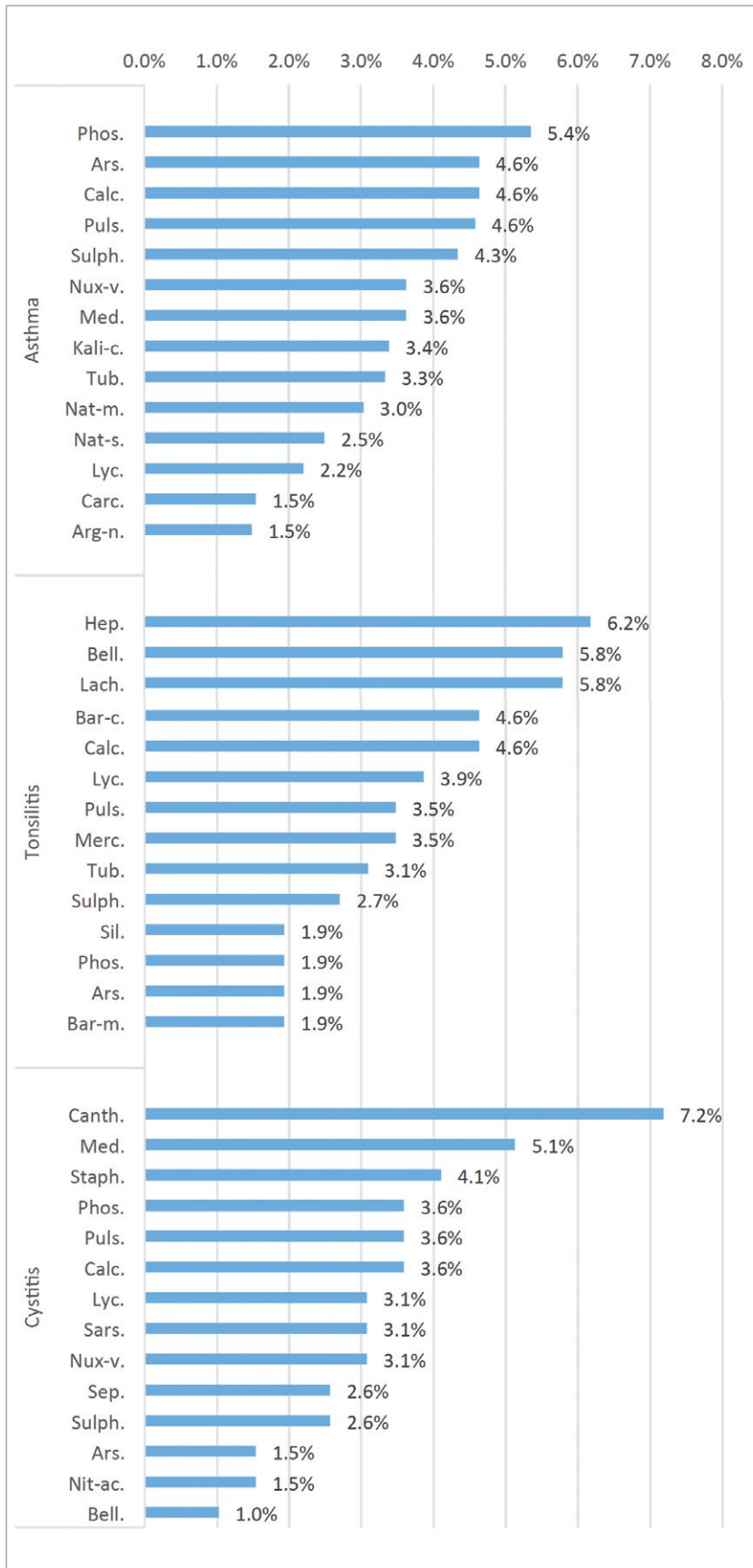


Figure 9:  
Most typical remedies used for  
treating common pathologies



(Figure 9: continued)



Figures 10 and 11 compare the most commonly used remedies and rubrics in depression cases with the prevalence of use of these remedies and rubrics in all cases.

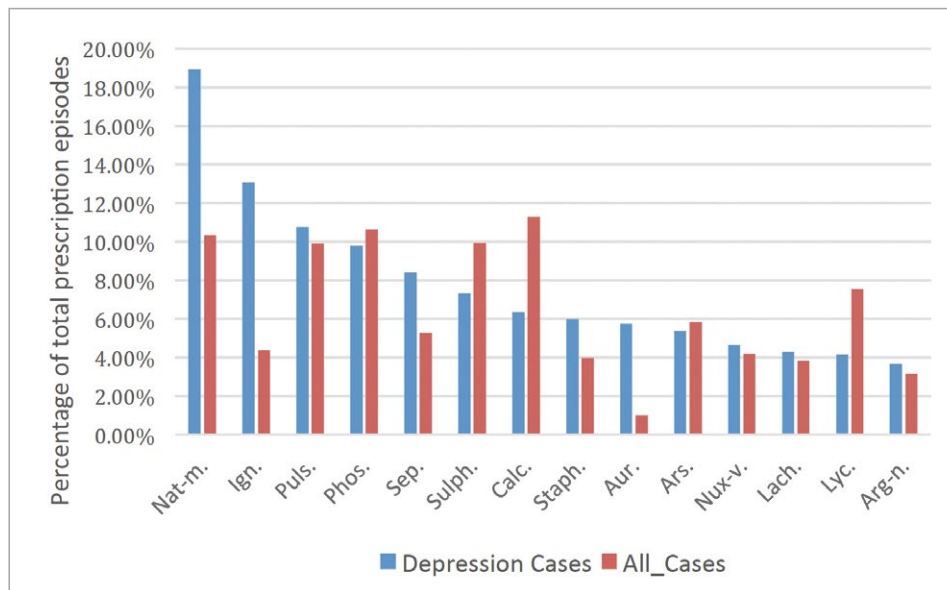


Figure 10:  
Most commonly used remedies in depression cases, compared to the use of these remedies in all cases.

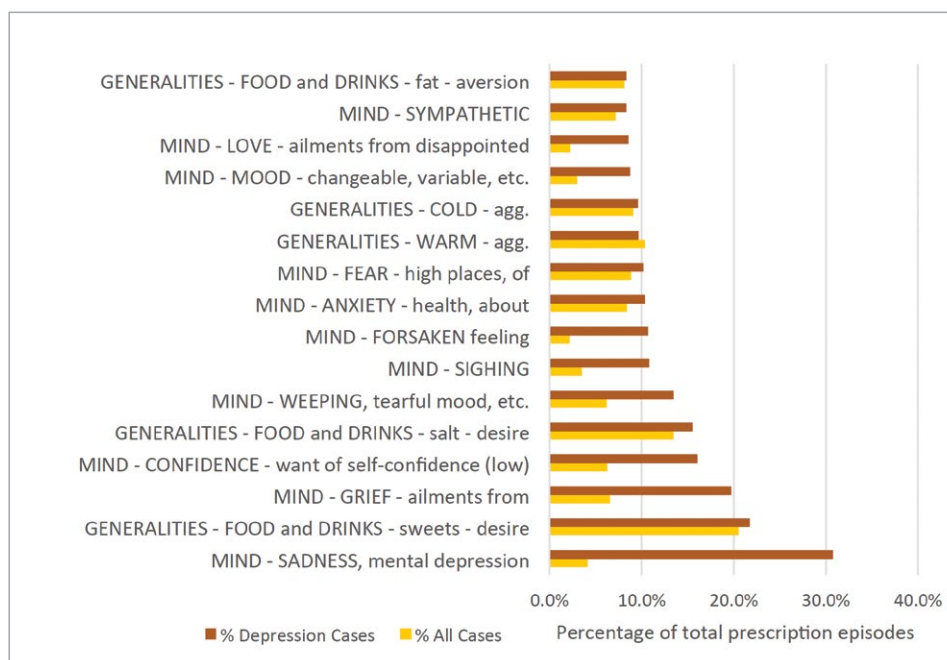


Figure 11:  
Most commonly used rubrics in depression cases, compared to the use of those rubrics in all cases.

## Cumulative Occurrence of Commonly Used Rubrics

This analysis identifies the percentage of the rubrics which are actually used by the homeopathic practitioners. We compared the total number of rubrics used in all cases with the total number of rubrics in the whole repertory.

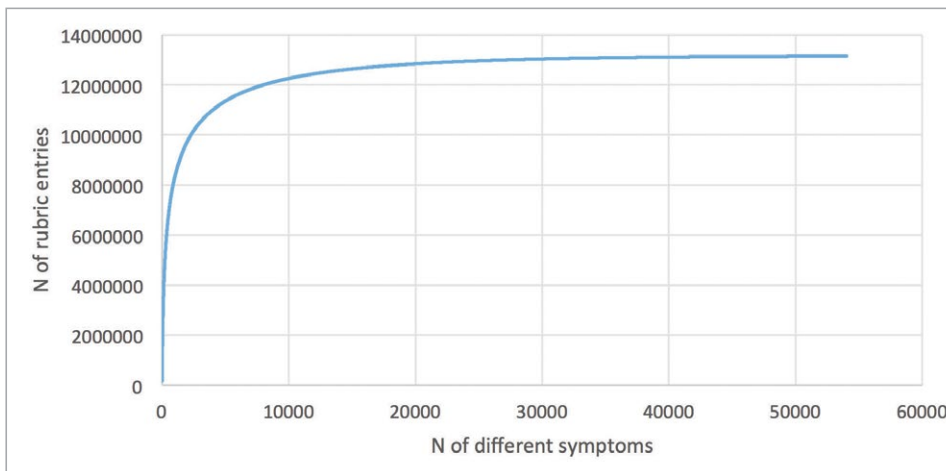


Figure 12:  
Number of rubric entries,  
plotted cumulatively against  
the number of different  
rubrics used.

### We concluded on the following:

1. In total, 13,144,699 rubric entries were analyzed. Out of 77.803 rubrics in the repertory, merely 54.038 symptoms were used. 23.765 rubrics were not used at all whereas 4.833 were used only once.
2. From MIND and GENERALITIES, most commonly used chapters, 70.04% and 66.01%, of the rubrics were respectively used.
3. The cumulative frequency graph (figure 12) illustrates that only approximately 3,000 rubrics were used in 80% of all rubric entries, and that 22.000 rubrics (one third of the repertory) represent 98% of all rubric entries.

## Rubrics related with successful treatment results

Our repertory consists of approximately 70,000 rubrics. We know that some symptoms are of great value and represent the “Keynotes” of certain remedies. Is the use of certain rubrics, associated with better results?

Are particular rubrics more useful and reliable than others?

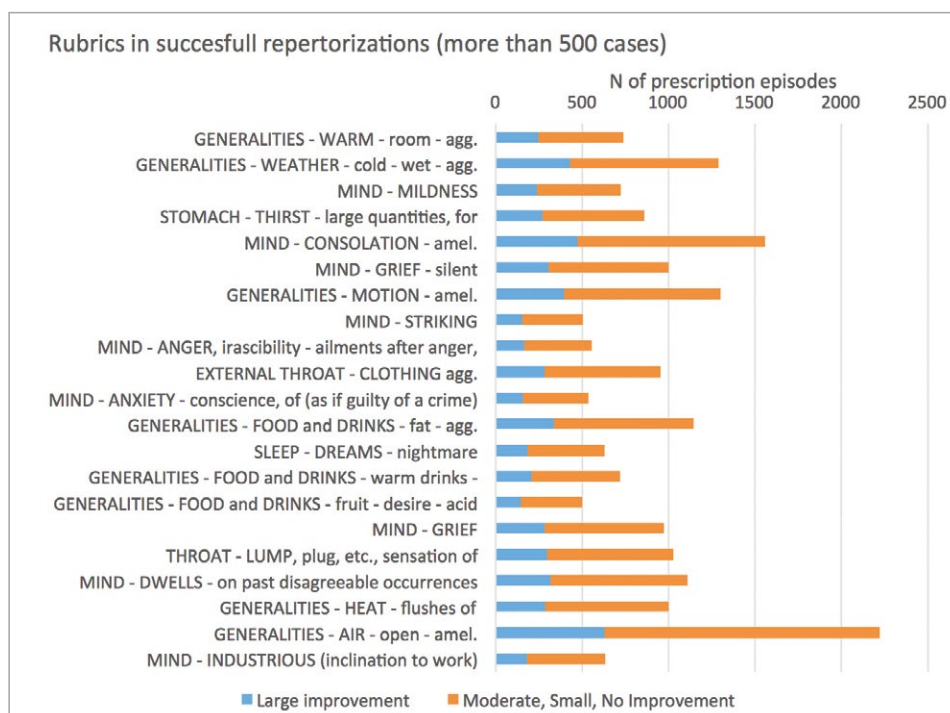


Figure 13:  
Most commonly used rubrics,  
dichotomized by the outcome  
of the prescription.

To investigate these questions, we analyzed the rubrics of the prescription episodes with documented follow-ups independently of the prescribed remedy. We focused on the most common rubrics used at least five hundred times. For each of these rubrics we determined the number of prescriptions that resulted in the outcome: “Large Improvement” and expressed the occurrence of a successful remedy prescription as a percentage, dividing it by the total number of prescription episodes. The results of these analyses are shown in figure 13 and table B. Figure 13 illustrates that “Generalities, amelioration in open air” was the most commonly used rubric, followed by “Mind, amelioration by consolation” and “Generalities, aggravation by cold, wet weather”. Table 1 expresses the percentage of times that a rubric led to a successful remedy prescription (large improvement). It shows that “amelioration in open air” was associated with a successful prescription in 28% of all prescription episodes while using that rubric, and the less commonly used rubric, “aggravation in a warm room”, was associated with a successful prescription in 34% of all prescription episodes

As in the table below, the less commonly seen modality, “aggravation in a warm room”, appears to be more reliable and useful than the common modality “open air ameliorates”. Analyses of a wider range of rubrics (used less than 500 times) further confirm these findings. A possible explanation could be that a greater number of remedies in these rubrics are valid and/or that their corresponding grading is more accurate. This helps in the selection of the indicated remedy, resulting in better outcomes compared to other rubrics.

The table below indicates the rubrics associated with the best outcomes.

SYMPTOMS	LARGE IMPROVEMENT	MODERATE, SMALL, NO IMPROVEMENT	PERCENTAGE
GENERALITIES - WARM room - agg.	248	491	34%
GENERALITIES - WEATHER cold - wet - agg.	430	857	33%
MIND - MILDNESS	238	485	33%
STOMACH - THIRST large quantities, for	269	591	31%
MIND - CONSOLATION - amel.	475	1084	30%
MIND - GRIEF - silent	304	696	30%
GENERALITIES - MOTION - amel.	395	906	30%
MIND - STRIKING	153	352	30%
MIND - ANGER, irascibility - ailments after anger, vexation, etc.	167	387	30%
EXTERNAL THROAT - CLOTHING agg.	281	673	29%
MIND - ANXIETY - conscience, of (as if guilty of a crime)	158	379	29%
GENERALITIES			
FOOD and DRINKS - fat - agg.	336	808	29%
SLEEP - DREAMS - nightmare	184	446	29%
GENERALITIES - FOOD and DRINKS - warm drinks - desire	209	509	29%
GENERALITIES - FOOD and DRINKS - ruit - desire - acid (sour)	146	356	29%
MIND - GRIEF	281	692	29%
THROAT - LUMP, plug, etc., sensation of	296	730	29%
MIND - DWELLS - on past disagreeable occurrences	317	793	29%
GENERALITIES - HEAT - flushes of	285	713	29%
GENERALITIES - AIR - open - amel.	629	1592	28%
MIND - INDUSTRIOUS (inclination to work)	179	454	28%

Table B: Outcome following prescriptions that included the most commonly used rubrics in the repertorisation



## Analysis of associations between remedies and symptoms (Likelihood Ratios)

VC works on identifying the most reliable and useful rubrics by correlating rubrics used with outcome, as explained in the previous section. As in our previous Research Bulletins, VC is continuously working on improving the reliability of information in the rubrics by statistically analyzing the association between remedies and symptoms.

When the prevalence of a symptom used in a successful prescription of a particular remedy is higher than the prevalence of that symptom in the general patient population, it becomes a positive prognostic factor for that remedy. This is something that each homeopath will do in his/her daily practice as he/she accumulates observations in the treatment of his/her patients. However, it is important to note that our memory can be flawed and biased. We can remember something fascinating, which triggers an emotional response, due to our memory overestimating such events. A statistical approach is necessary in order to be able to decrease this overestimation. Likelihood Ratio is a formal mathematical calculation, an indication of the patient's improvement related to the pertinent combination [symptom(s)-remedy]. LR compares the prevalence of particular symptoms in patients treated successfully, with a particular remedy by the prevalence of these same symptoms in the general patient population. Consequently, VC is actively engaged in working towards a statistically confirmed repertory.

Symptoms Combination - Remedy	LR_min	LR
<b>MIND - DANCING</b>		
Carcinosinum	5.64	9.76
Sepia	3.73	5.73
Tarentula hispanica	14.89	25.85
<b>MIND - FEAR - bees, bugs, wasps that sting, of</b>		
Hepar sulphuris calcareum	8.35	24.83
Phosphorus	1.52	3.08
<b>MIND - FEAR - death, of</b>		
Aconitum napellus	7.59	10.46
Arsenicum album	3.31	4.35
Kali arsenicosum	5.96	10.23
<b>MIND - FEAR - failure, of - business, in</b>		
Lycopodium	1.46	3.28
Psorinum	11.50	29.35
<b>MIND - FEAR - snakes, of</b>		
Lac caninum	13.48	16.64
Lachesis	5.10	6.38
<b>MIND - FORSAKEN feeling - beloved by his parents, spouse, friends, feeling of not being</b>		
Pulsatilla	3.99	5.54
<b>MIND - INDIFFERENCE, apathy, etc. - loved ones, to</b>		
	13.05	18.05
<b>MIND - STRIKING - desire - to strike</b>		
Hyoscyamus niger	4.40	11.62
Stramonium	2.31	5.58
<b>MOUTH - SALIVATION - night</b>		
Mercurius solubilis	19.14	27.52
<b>BACK - PERSPIRATION - Cervical region - night</b>		
Calcarea carbonica	6.16	9.62
<b>GENERALITIES - FOOD and DRINKS - cucumber - desire</b>		
Antimonium crudum	5.85	21.36
Veratrum album	17.10	28.43
<b>GENERALITIES - FOOD and DRINKS - ham - desire</b>		
Tuberculinum bovinum	9.86	16.15

## Repertory development from clinical cases

VC is continuing its efforts to develop a highly confirmed repertory. This includes the verification of rubrics through statistical feedback from real cases along with adjustments of the keynotes' grading.

For this purpose, we made use of an extensive dataset consisting of 100,936 cases. We compared the VC repertory consisting of 77,803 symptoms, a smaller "Likelihood Ratio confirmed" repertory (LR Rep) consisting of 2,851 symptoms, 194 remedies and 11,289 statistically analyzed remedy-symptom pairs and the 'flat' (VC Flat) repertorisation based on all the symptoms in the VC Repertory.

### Comparison of LR Rep vs VC Flat

Based on a retrospective analysis, 1,100 well-documented cases with successful ('large improvement') outcome were selected and repertorised with two different repertories: - the "VC flat" repertory and the "LR Rep" repertory. For each case, we assessed the position in which the indicated (confirmed) remedy appeared in the list of proposed remedies using the two repertories. Figure 14 is based on these analyses; depicts (cumulatively) the percentages of the test cases (vertical axis) in which the correct remedy occurred in varying (increasing) ranges within the list of suggested remedies of the two types of repertorisation (horizontal axis).

#### Cummulative percentage of cases successfully identifying the indicated remedy

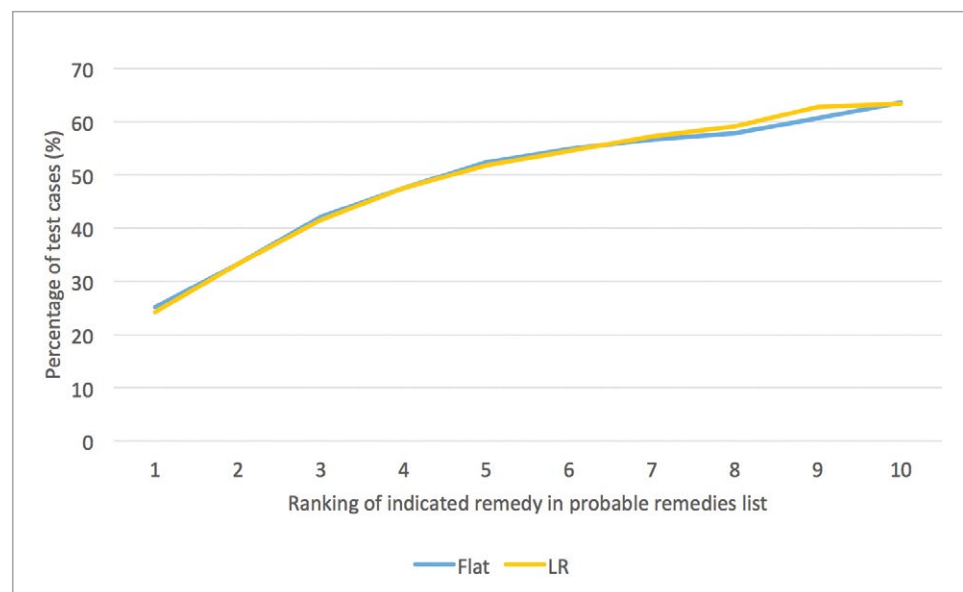


Figure 14:

Inclusion of indicated remedy within top positions of remedy listings as suggested by the flat versus the LR-Rep repertorisations.

The first point on the curve shows the percentage of the test cases in which the indicated remedy was the first of the suggested remedies. The indicated remedy came up in the first position in 25% of cases when using “VC Flat” and in 22% of the cases when using “LR Rep”.

Figure 14 illustrates that the smaller LR repertory (LR Rep) despite containing far less symptoms, leads to similar results to that of the Flat repertory (VC Flat) that uses all the symptoms. This confirms that the LR Rep, although smaller, has a higher percentage of reliable rubrics.

## Comparison of VC Brain vs VC Flat repertory

The ‘VC Brain’ repertory is the expert system that combines information from repertory and statistical analysis of cases. It also contains all the algorithms for processing the case data in order to suggest the most probable remedies and assists in the differentiation between remedies. We compared the VC Brain to the VC Flat repertory by using the same set of successful cases.

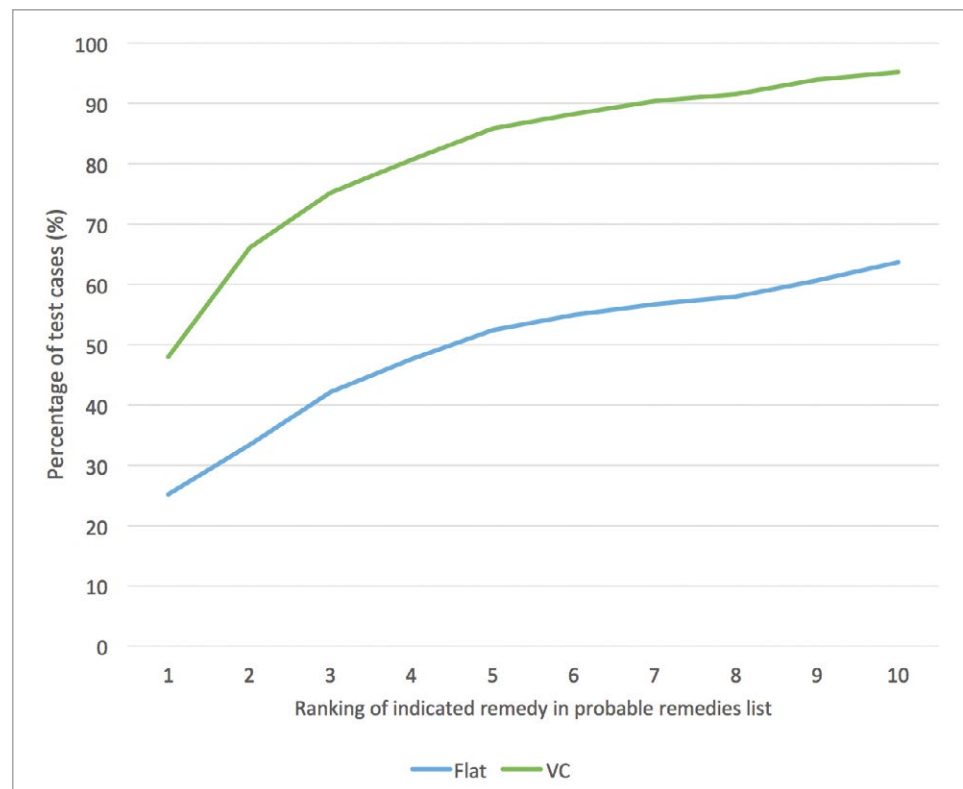


Figure 15:

Cumulative percentage of inclusion of indicated remedy within top positions of remedy listings as suggested by the Flat versus the VC Brain reps.

In Figure 15 presents the comparison of the results between VC Brain Rep. versus Flat Rep. A significant difference was determined in the percentage of cases with the proposed remedy in the first five positions. The results of the proposed remedy in the first five positions were much higher when using VC Brain than when using VC Flat. The percentage with VC Flat was of approx. 50%, whereas with VC Brain the percentage was higher than 80%.

This significant difference is due to the accuracy of the VC Brain, which is the result of scientifically developed algorithms based on the practice of expert homeopaths together with statistical analysis and validation against a large set of real-world successful homeopathic prescriptions.

### Percentage of cases successfully identifying the indicated remedy

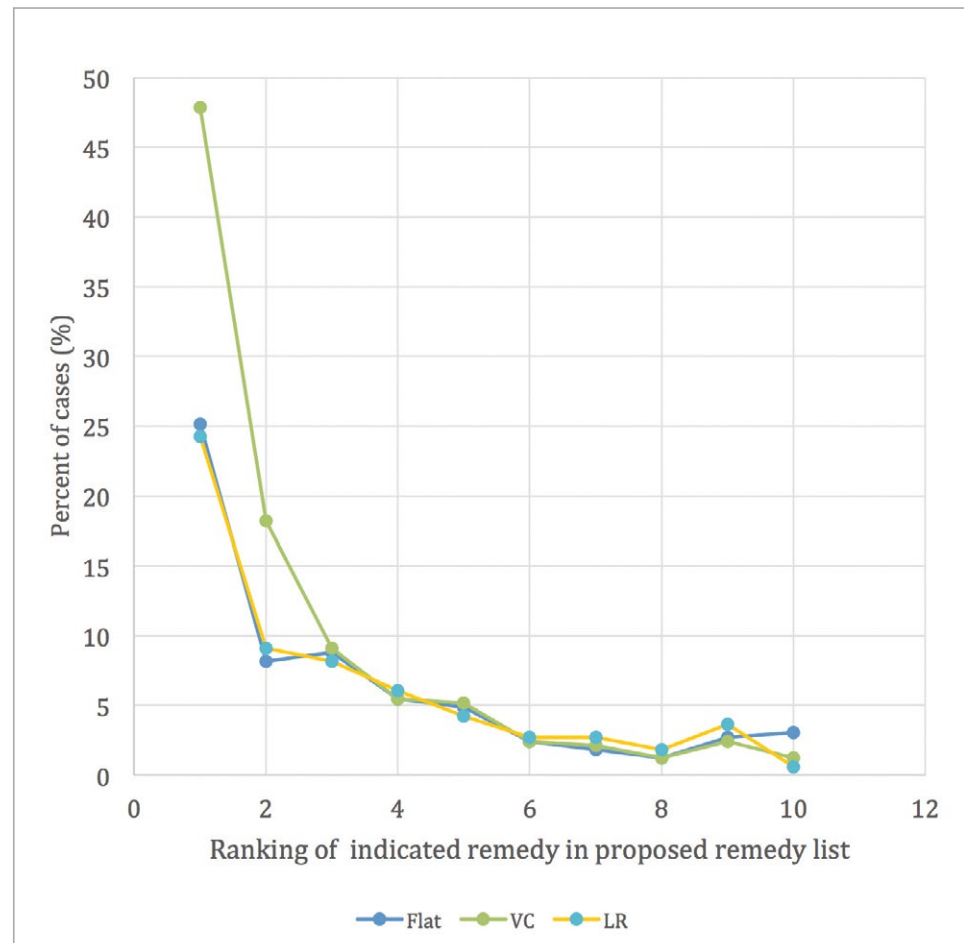


Figure 16:  
Percentage of indicated remedy within top positions of remedy listings as suggested by the Flat Rep versus the VC Brain Rep.

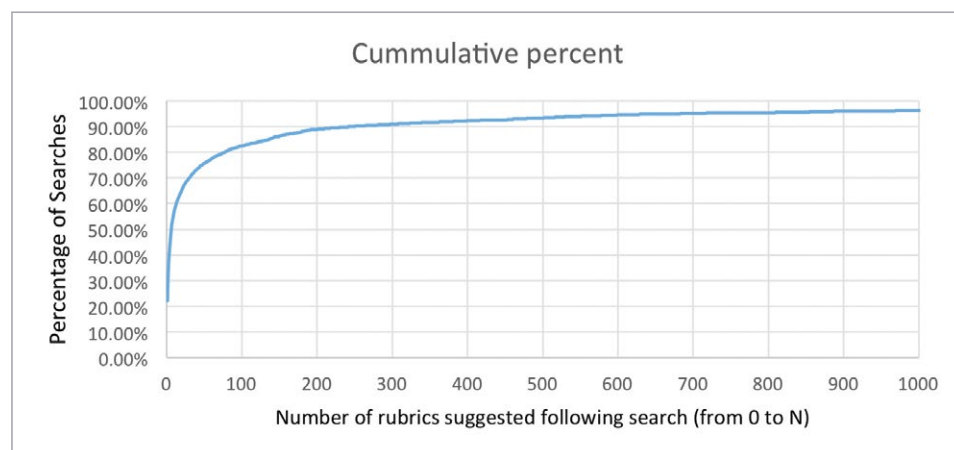
## Analysing search patterns and accessing the suitable rubric in the repertory

The VC user needs to find the appropriate symptom in the repertory described by the patient. It is useful to have an intelligent search engine at hand, which aids the user in quickly, and accurately finding the rubrics within the repertory. The VC search engine has several features that help the homeopath-user.

Further to an analysis of users' behavior as to the terms used to reach the desired rubric, the following features were implemented:

- Term suggestions and auto-complete during typing
- Spell checking and suggestion of correct word(s)
- Synonyms, Related Phrases and Rubrics
- Suggested Rubrics in Results (marked)
- Results sorting according to more important results
- Quick filtering of results

Figure 17:  
Cumulative distribution of the percentage of searched symptoms in relation to the number of suggested rubrics



There are two main categories of search results where the user needs further assistance: (a) 22% of searches that have no results, (b) 20% of the search queries that result in more than i.e. 80 rubrics. This requires substantial browsing throughout the results in order to select the appropriate rubric. VC has worked hard on both these search categories.

To address the category with insufficient results, we first developed a suitable database of synonyms. Existing databases with synonyms (Thesauruses) were adapted in order to include the terms that a homeopath would possibly need to use instead of the specific term in the repertory. A detailed Thesaurus of synonyms has also been developed, using words, relative to the homeopathic index (repertory). A word may have several meanings, hence many synonyms. Therefore, we only kept the synonyms related to the specific terms. Tools such as "stemming" (detection of words according to their roots), spelling correction, and automatic suggestions (auto suggest) were included. Our online platform enables the monitoring of user requests by analysing the most common causes of searches that do not produce any results. This approach is also used by advanced internet search engines, which adjust the results by analyzing human behavior.

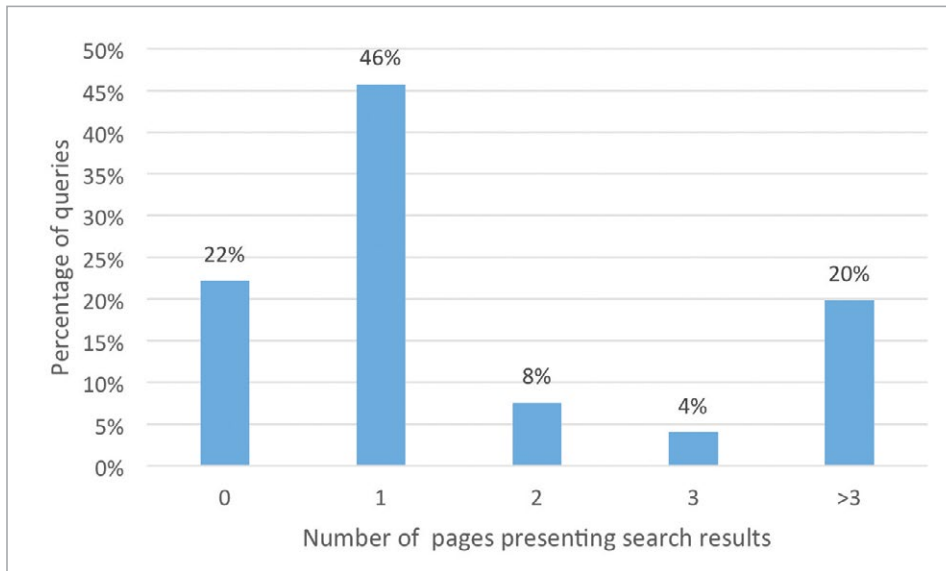


Figure 18:  
Percentage of searches  
in relation to the number  
of result pages with symptoms  
(24 rubrics per page)

We also worked on the category where the search queries are too general thus resulting in a great number of rubrics. The priority of the most relevant rubrics listed on the first page of results is based on a scoring function that takes into account many parameters such as i.e. (a) similarity between the search term and the rubric, (b) most general rubrics (c) number of times rubrics have been used by other users. VC also includes a new feature that displays related words to the search terms in the repertory, in the function of a "World Cloud". This way, the user can see all the related terms and can easily select one, that he/she needs and perhaps did not have in mind at the time. For example, when searching for the word "pain", one can see the results with all the types of pain and its affected areas. "Word Cloud"- is extremely useful when a search results in a large number of rubrics making navigation difficult, especially when the exact wording of the required rubric is not known.

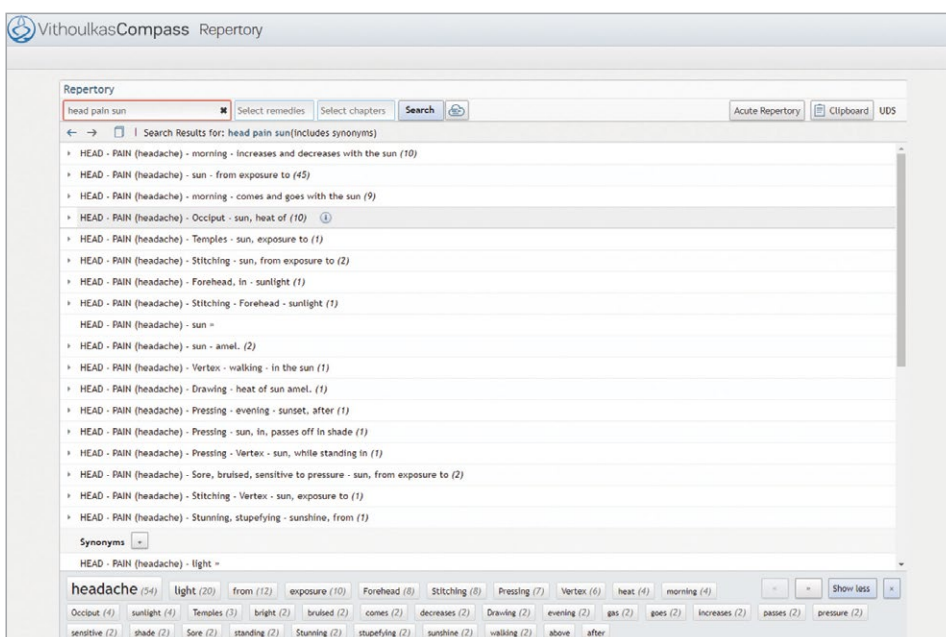


Figure 19:  
VC screenshot showing  
"Word Cloud" functionality

## B. Decision-making in homeopathic consultations

Decision making in homeopathy is a complex and multidimensional procedure. The homeopath has to fulfill certain conditions in order to find the appropriate remedy and have successes in a consistent manner. Knowledge of the Materia Medica, access to a reliable repertory, adequate and comprehensive case taking and judicious decision-making are some of the key conditions that need to be fulfilled.

## Multiple dimensions of homeopathic consultation

The multiple dimensions of the homeopathic consultation are illustrated in the figure below.

Each dimension consists of a number of more detailed aspects, further underlining the complexity of the homeopathy consultation process. This complexity is taken into consideration by the VC R&D Team as part of its goal to continuously enhance and improve the repertory. For a full listing of these aspects, see the extended chart in appendix 1.

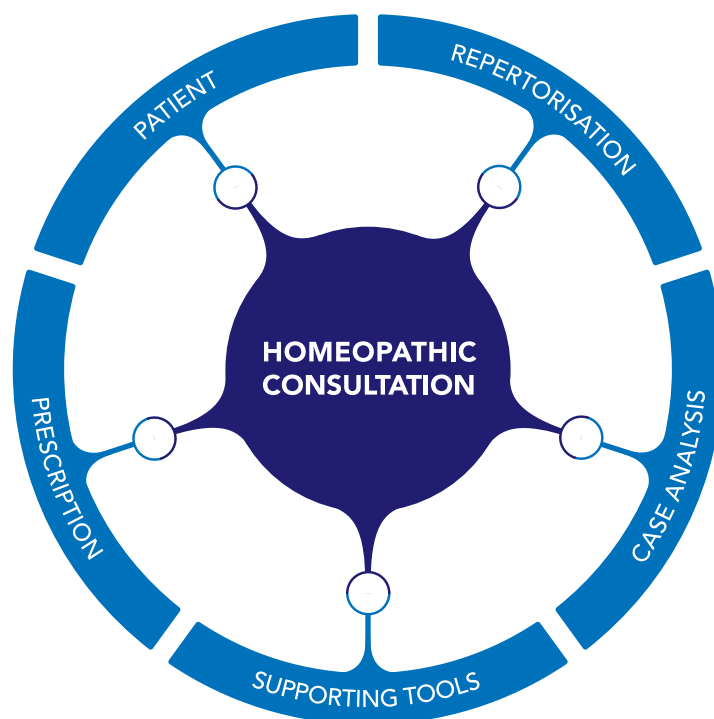


Figure 20:  
Dimensions of homeopathi  
consultation

## Biases in decision making

Due to the complexity of the consultation and the remedy selection process, a homeopath rarely has all of the required information to be completely certain of his or her decisions. Therefore, like in most other branches of medicine, decision-making takes place under conditions of uncertainty. It is well known that decision-making under uncertainty is susceptible to a number of biases. A bias is any kind distortion of reality, resulting in a deviation from the truth. Various biases can affect clinical decision-making. Homeopaths combine slow, rational decision-making with fast, intuitive (heuristic) decision-making in their daily practice. It is important to be aware of the most common biases, and to apply critical thinking in order to reduce bias and improve the success of clinical practice.

Hahnemann refers in the 6th paragraph of his Organon, to the need for the physician to be an unprejudiced observer. Whilst laudable as an objective, it of course impossible for a homeopath to be completely unprejudiced. This is why it is important to be aware of the most common biases that can affect decision making in homeopathic practice.

Perhaps the most common bias in clinical decision-making is overconfidence, which can lead to (wrong) confirmation of pre-existing beliefs (confirmation bias). The tendency to suppress ambiguity and confirm pre-existing beliefs are deeply engraved in the functioning of our brain by evolution. Fast, associative, decision-making can be useful, particularly in routine circumstances, but also less reliable due to the brain's tendency to 'jump to the wrong conclusions' based on limited or poor quality information. The latter principle is also referred to as the "availability heuristic". This is a tendency to base decisions on familiar information and to ignore the quality of available information, thus, unconsciously filling in the gaps in a search for confirmation and 'cognitive ease'.

In conclusion, all humans are susceptible to biases in decision-making and because many of them are unconscious, it is impossible to avoid but possible to reduce the likelihood of these biases.



## C. Addressing biases and improving decision making

### THE IMPORTANCE OF CRITICAL THINKING

Critical thinking is defined as the ability to adopt a constructively critical approach to beliefs and claims. Simply put, reflective thinking focused on deciding what to believe or do.

The scientific understanding of various cognitive biases that can affect human decision-making has evolved rapidly during the last decades. However, the translation of this knowledge into the practice of medicine has been relatively slow. Selecting the correct remedy in homeopathy is a highly complex decision. It is therefore important to understand and address the main biases that can affect the homeopathic decision-making process, including how decision support technology can help homeopaths make better decisions.

## Tools for practitioners to address biases and improve decision-making

VC is at the forefront of implementing the evolving scientific knowledge on human decision making, and already incorporates a number of tools aimed at improving decision-making (one concise paragraph explaining characteristics of each tool, finishing with a sentence clarifying how it improves decision making).

### Synapse tool

Synapse tool for characteristic symptoms per pathology is a practical new way of accessing the repertory from the point of view of Themes. These themes are grouped in two categories. The first category of themes are subjects that concern areas examined in every chronic consultation (e.g. fears, sleep, weather conditions, food and drinks). The second category constitutes themes that are certain pathologies like migraine, sciatica, allergic rhinitis, premenstrual tension syndrome etc. These themes contain the most important related rubrics; for example, the PMS theme contains the most important rubrics of this pathology. As soon as the homeopath picks up the pathology during the homeopathic consultation, a template is created with the most related themes that lead to corresponding rubrics. The Synapse tool therefore facilitates access to the most relevant rubrics for the case, enabling a better repertorisation.

### Acute repertory

The acute repertory is a second repertory within VC with a different structure tailored to helping the practitioner analyse acute cases. The first chapters of this repertory constitute acute pathologies like Fever, Tonsillitis, Facial paralysis, Cystitis, but also acute mental conditions like Panic attacks, Stage Fright, Night Terrors etc. are included. Each of these pathology-chapters, has a tree of symptoms arranged in a practical way for easy access, guiding the practitioner through what has to be asked in each of these acute states. Furthermore the acute module, provides differential Materia Medica for each pathology with its Main Remedies and their main Symptoms.

### Thematic repertory

The Thematic repertory is a new development in VC, which is currently being used and tested internally. It will be released to all users soon. It features a new and practical way of grouping the repertory according to thematic entities and it is useful in "mapping" the remedies i.e. it can show the regions in the repertory in terms of themes where the remedy is more frequently present. In this way, the homeopath can understand better the affinity of the remedy, the areas or systems of the human body and mind where the remedy has most of its action. Detailed description of this new tool is provided in the next chapter of this bulletin.

### Symptoms prevalence data

A common source of bias is to neglect the base rate of symptoms in the general population. Polychrests are particularly sensitive to this bias. A quality or a characteristic becomes a symptom, only when it is above a threshold. The prevalence or base rate of a symptom in the general population helps in the evaluation of whether a trait is a symptom in a particular patient and also in a particular remedy. It can become a symptom only when its prevalence is above the prevalence of the general population. Ignoring the base rate (prevalence) of symptoms in the total patient population can therefore lead to wrong decisions. To address this, VC is taking the innovative step to make the prevalence of symptoms in the total patient population visible to all users of the repertory. This will enable the homeopath to better 'anchor' her/his experience with statistical information. This also helps to correct the tendency to overestimate the prevalence of certain symptoms. This is necessary because in our memory we tend to overestimate the prevalence of symptoms of striking cases (which trigger an emotional response in the practitioner) compared to the prevalence of particular symptoms in equally successful, but less striking cases.

Consequently making the prevalence data of symptoms available will enable the homeopath to learn more effectively from his or her own cases. Modern, 'cloud based' decision support systems like VC can continuously update and expand the symptom prevalence data based on the collective experience of all homeopaths that are using the system. Subsequently, this technological development enables a giant leap forward in the ability of each homeopath to improve his/her practice in a more reliable and efficient manner.

### Information on reliable rubrics

The homeopath who uses VC can see which are the most used rubrics in the repertory. This information on rubrics usage will be enhanced and become more sophisticated with more information from statistical analysis (see chapter Rubrics related with successful treatment results). Enabling the use of the more reliable rubrics will lead to better decisions and treatment results.

### Metadata

Metadata are extracts from the Materia Medica that give differential information among possible remedies in a case. What is special within VC, is that this fine differential information is contextual and appears when the homeopath needs it in order to understand the remedies deeper and decide on the appropriate remedy. For more information about Metadata, see Research Bulletin No.2.

### Remedy-symptoms correlations (Likelihood ratio)

The foundation for homeopathic decisions is the information in repertories and the Materia Medicas. This information should only be consisted by real pathological symptoms with the right intensity and not variations of healthy states. For example, jealousy can be a healthy feeling in certain conditions, but when it becomes distressing for the patient and his surroundings, then it becomes pathological. The same is true with physical symptoms as well, like thirst or desire for sweets. One of the most important biases affecting the information in homeopathic repertories is due to neglect of the 'base rate' of symptoms in the general population. This can be addressed by calculating the Likelihood Ratio of symptoms for the prescription of a particular remedy. The Likelihood Ratio takes into

account the 'base rate' of a symptom. Projects aimed at eliciting the Likelihood Ratio of symptoms are therefore essential to improve the reliability of the information in repertories and the Materia Medica. Vithoulkas Compass is fully committed to improving the repertory and engage in various Likelihood Ratio projects. Using more reliable and valid information, will lead to better and more accurate remedy decisions by the homeopath.

### Refined remedy grading in repertory rubrics

Every homeopath knows that in a rubric in the repertory, the remedies are listed alphabetically with their grading which is, in modern repertories, from 1 to 4. In many rubrics, VC also calculates intermittent grading for better accuracy.

This refining of grading is made by:

- **Literature review**

The VC team has been constantly improving and adding new information in the repertory by studying and reviewing homeopathic literature.

- **Expert opinion**

The VC Team is connected to a broad family of expert homeopaths that always offers their feedback for additions and corrections in the repertory and the Materia Medica which is implemented within VC.

- **Statistical feedback from cases with positive outcome**

Clinical experience has been a known way of adding and refining information in the repertory and the Materia Medica. It was extensively used by Kent and by our other masters. When a symptom is eliminated after the administration of a remedy, then it becomes a candidate symptom for addition in the repertory. Bayesian statistics and use of Likelihood Ratios of symptoms as prognostic factors are ways of adding and refining repertory grading through clinical experience. If a remedy's Likelihood Ratio is high and the grading is relatively low, then this grading is considered for review. This grading refining also takes into account literature review and expert's opinion.

### Suggesting probable remedies based on analysis of successful prescriptions

VC Brain consists of sophisticated algorithms that take into account various parameters like the rubric size (rubrics with fewer remedies are more important than large rubrics), the underlining in correlation with the remedy grading within the rubric, the keynote symptoms and the nature of symptoms (mental symptoms and general modalities are more important than local symptoms). From the very beginning of VC's development, the implementation of the VC Brain was also based on cured real cases from which, by using statistical methods, the above parameters were confirmed and fine-tuned. We continuously evaluate and improve the expert system through by updating series of test cases. (see Appendix: Expert System). This is also a reason why VC values the importance of high quality clinical cases.

### Case specific symptoms that differentiate between the probable remedies.

Frequently, during case-taking, the practitioner has to decide between the candidate remedies, the selection of the appropriate remedy and ask the suitable questions in order to "clear the picture". The Differential Analysis offers the correct questions in the form of rubrics helping the homeopath to find the indicated remedy. For more information, see Research Bulletin No.2.

## D. Highlights on ongoing projects to improve decision making

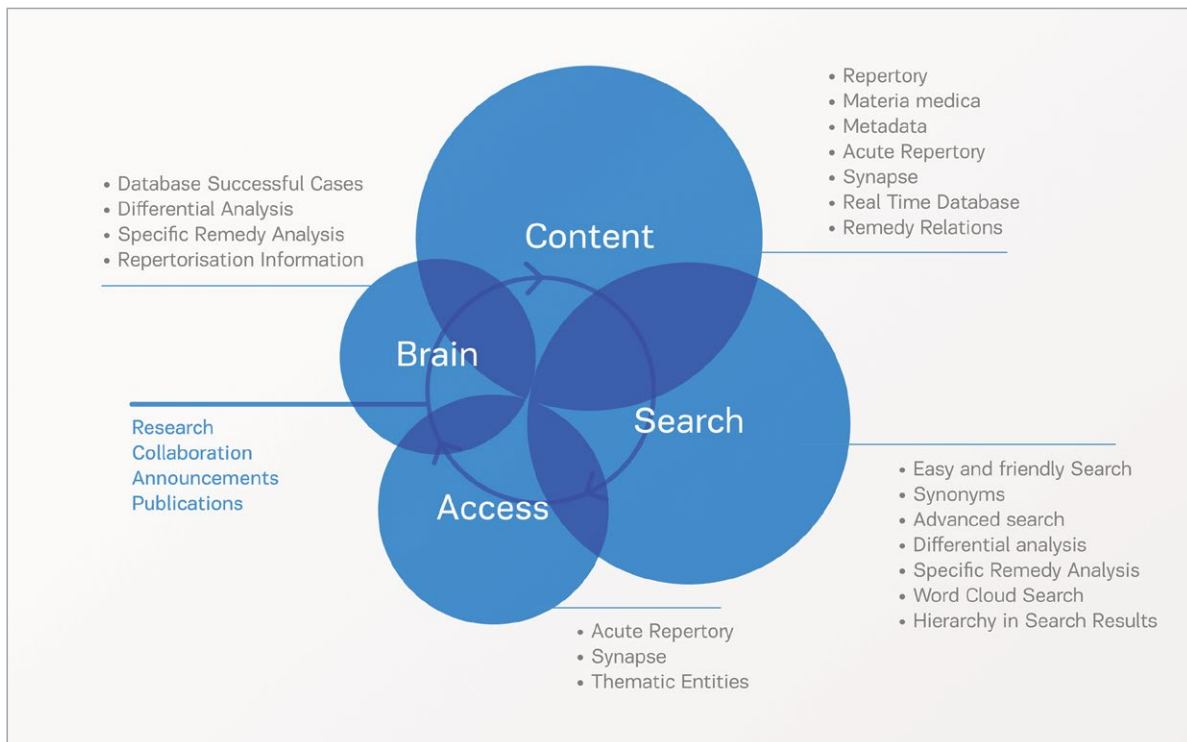


Figure 21: Areas of improvement in VC core components

## Thematic Repertory - intelligent navigation and thematic associations

The traditional structure of the repertory was developed according to the capabilities and the general environment of 200 years ago. Kent's repertory is a stunning work that largely passed the test of time, which is why Kent's repertory is being used even today. Kent introduced a certain structure and produced one of the cornerstones of homeopathic practice. Prof. George Vithoulkas stated that in his first 30 years of practice, Kent's Repertory was his main resource, enabling him to achieve formidable success in his cases and worldwide recognition. Moreover, Kent's Repertory, due to its fundamental completeness, was a good platform on the basis of which additions and fine-tuning could be effectively applied.

However, the chapter-based, alphabetical, order of the classic repertory presents some important shortcomings for both the homeopathic practitioner and the researcher who aims to study and develop it. In order to locate a rubric, especially in a large chapter, the practitioner needs to remember it correctly. Browsing takes time and does not increase the focus of the reader on the required subject, as the order of the rubrics is alphabetical. In addition, the formal syntax of Kent's rubrics is often confusing. If the practitioner browses the rubrics and misses the relevant rubric there is considerable lost time and/or significant probability of a weak repertorisation. All these issues are multiplied for relatively inexperienced homeopaths. The same applies to the researcher or homeopath who studies a specific subject, a family of symptoms or performs a differential analysis of remedies. The requirement for complete knowledge of the rubrics for a specific family of symptoms is heavily dependent on the level of knowledge and the memory of the practitioner.

VC team has been working hard on the above issues and has already developed several features to approach these problems like a powerful search engine, search with synonyms, the Synapse workflow, a new pathology based acute repertory, etc. The traditional structure of the repertory also has the weaknesses that rubrics with similar themes and meanings are in entirely different parts of the repertory. In order to further help the practitioners and researchers address this issue, VC has decided to implement a thematic approach.

The thematic repertory will be, in effect, a series of mini repertories with very little co-dependency between them. They cover completely the rubrics of a specific family of symptoms and complexity can only arise if a rubric needs to be included in more than one theme. The VC Thematic Repertory structure enables rubrics to be used in more than one theme, not only to facilitate with ambiguous or multi-faceted symptoms. It also provides the freedom to construct new thematic entities, which might be subsets of previous ones or partially overlap one or more of them. With the addition of themes, semantic structures are added to the presently flat repertory so in effect more intelligence is added, making it an indispensable tool for clinical practice.

**NERVOUS SYSTEM**  
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**PATHOLOGY**  
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**CHARACTER**  
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**TIME**  
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**AGE**  
children  
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children

**TEMPERATURE**  
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weather conditions  
weather conditions  
weather conditions

**DIGESTIVE SYSTEM**  
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mouth  
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**CIRCULATORY SYSTEM**  
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bradycardia

**FOOD + DRINKS**  
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food and drinks  
food and drinks  
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food and drinks

**MENTAL STATE**  
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**REPRODUCTIVE SYSTEM**  
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**CHARACTER**  
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**MENTAL STATE**  
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**REPRODUCTIVE SYSTEM**  
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male-impotency

**MODALITY**  
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modalities

A further development will enable users to construct their own thematic entities and propose them for addition to the VC Thematic Repertory or just personal use. Therefore, every user will be able to work with a personalized repertory structure. During the last months, the thematic approach has been beta tested, during which it received very positive feedback by members of the homeopathic community.

During both homeopathic practice and research a need often arises to study a set of symptoms, usually thematically connected, and identify the most prominent remedies in play, some possible local or general keynote symptoms, etc. The operations performed by the homeopath are generally straightforward but can be time consuming and require strong concentration. The result of this analysis is more qualitative and multifaceted than just the scoring of remedies. The goal is to construct the picture of prominent remedies within a specific family of symptoms with as much detail as possible.

Figure 23: Analysing repertory themes and remedies



To address this need, the VC team researched the possibility to develop an algorithmic/ heuristic software module to perform this task. This Rubric Analysis tool can quickly assess any set of symptoms, a thematic entity, a search results set or even a collection of rubrics in the VC Repertory Clipboard. The result is a report, which presents an analysis of keynote symptoms, highest graded symptoms, smaller rubrics, remedies which 'stick out' with a markedly higher grade in rubrics and the consistent presence of remedies in the rubric set. This report can also include any rubric metadata present and also enable the user to quickly focus on specific remedies and display their rubrics.

When this tool is ready, practitioners and researchers will be able to use the repertory in novel ways and generate information, which up to now was relatively difficult to access. For example, a user can perform a search using a modality, i.e. 'after eating' or a term like 'exertion' and receive a multi-approach report of the remedies, which are relevant. In effect, the user creates a temporary thematic structure and analyses it on the fly. It is notable that using this tool along with the Thematic structure, experienced homeopaths can assess the completeness and consistency of the repertory much faster, and, using the Add Info/Contribute function of VC, easily propose amendments and additions.

## Rubric Clipboard - a useful addition when browsing the repertory

Our users reported that many times they wanted to put aside a rubric or a collection of rubrics in order to assess them later, for a specific case or for study. This new practical function provides the space and stores rubrics even after the user is logged out from VC, so that they are readily available at the next VC usage.



## Psychometric testing - increasing the reliability of the consultation.

One of the weakest links in the Patient-Repertorisation-Analysis-Prescription chain is the accurate reporting of symptoms, especially psychological - MIND symptoms, by the patient. The prevalent emotions and other conditions are central to remedy selection. An inaccuracy of information received in the homeopathic consultation can arise due to a number of factors:

- A patient who does not disclose, willingly, due to embarrassment or fear, an accurate picture of his/her psychological state.
- The inability by the patient to describe this state (due to problems in expressing one's self or due to stress during the consultation)
- The presence of the homeopath and the 'chemistry' with the patient can affect the two factors above.
- The experience of the homeopath. To extract the true psychological condition of the patient in a way is an art which most times requires skill, patience and knowledge. Psychometric testing is a well-established and researched field within psychology/psychiatry. There has been a development of sophisticated methods and tests to measure with relative accuracy several parameters of a patient's psychological profile. Psychometric tests will soon be provided on a platform linked to VC.

# E. Appendices

## Consultation dimensions

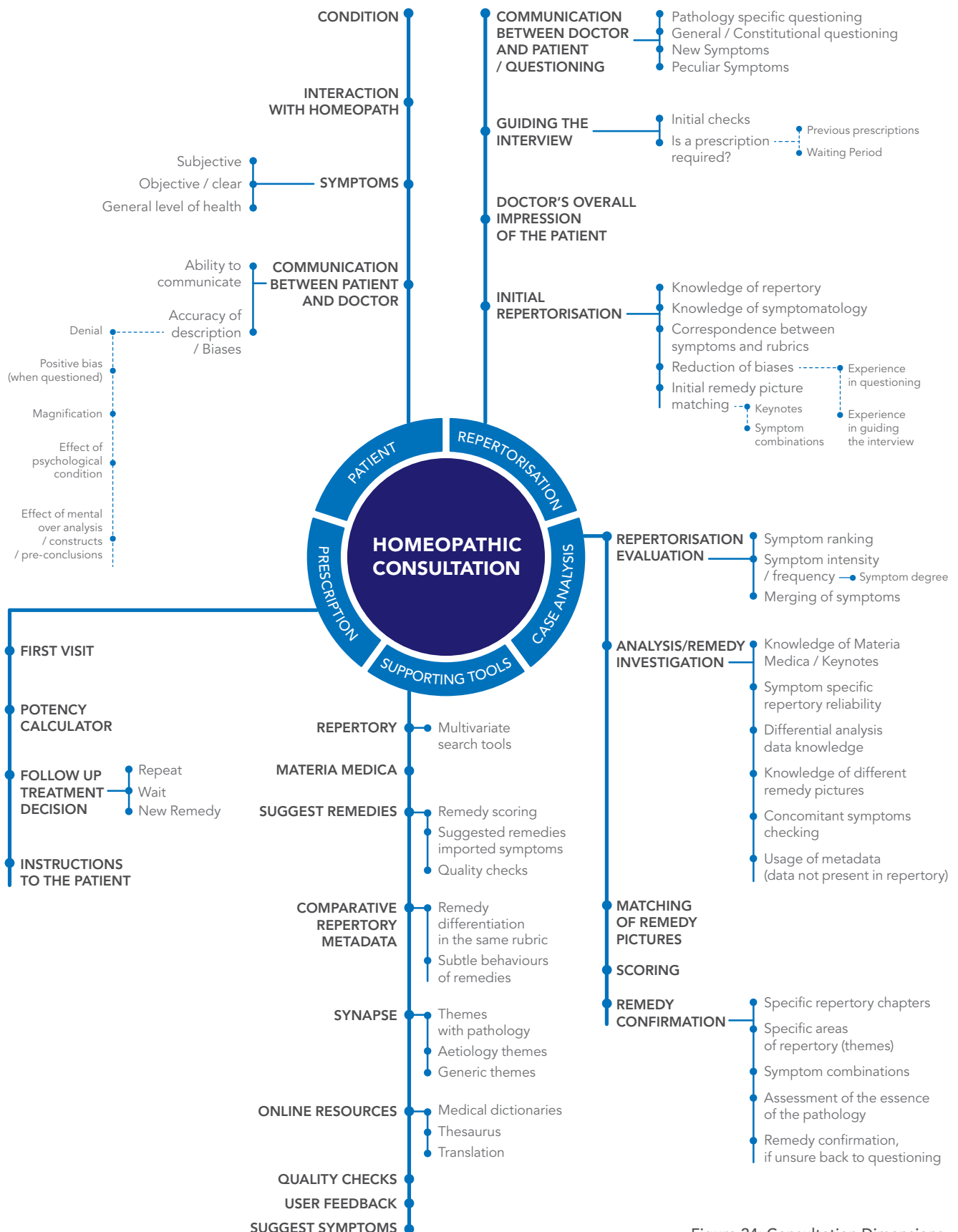


Figure 24: Consultation Dimensions

# Development of Acute repertory and Synapse tool

The **Acute repertory** and **Synapse** are continuously refined and improved. In collaboration with highly experienced homeopaths, we are enriching the content of the repertory, Materia medica and differential Metadata, using as a source the classical bibliography. By analyzing and processing the searches of users, we identified the need to create a more convenient repertory for acute diseases.

Many cases with common pathologies in repertorisation frequently included specific rubrics. Thus we recognized the necessity of **clustering the symptoms according to pathologies**.

Taking into account the concerns of homeopaths to identify the correct rubrics in the Repertory, the VC team developed two successful expert tools, Synapse and Acute repertory to assist access to and selection of the correct rubrics during the repertorisation. By analyzing case data, as well as taking into consideration feedback by the users and expert homeopaths, a more functional approach to identifying the appropriate rubrics has been created. At the same time, there is always the possibility, of using the full Repertory.

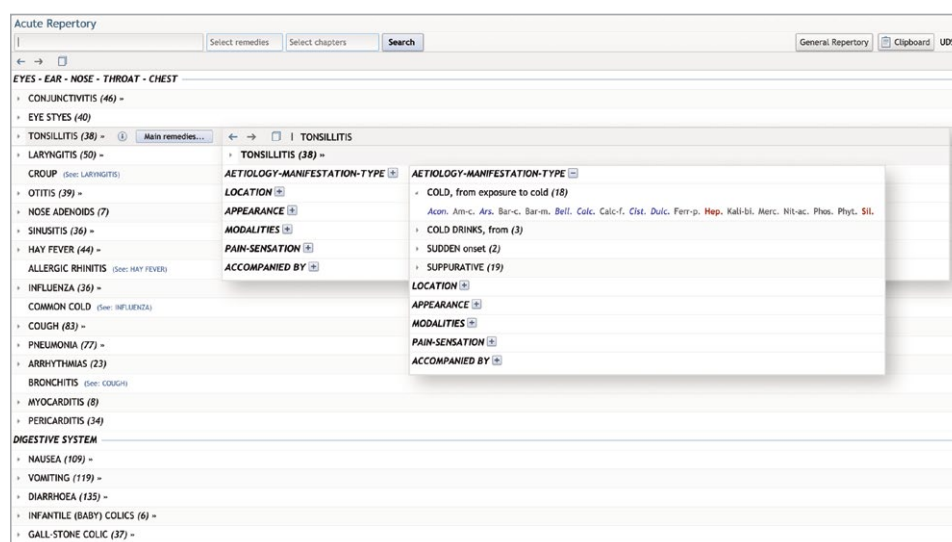


Figure 25: Acute repertory

## Development of Acute repertory

The Acute repertory is based on a special structure to facilitate case-taking. In more than 80 acute pathologies, including injuries, traumas, dental problems etc., the related and correlated proven rubrics were grouped in searching levels, guiding the homeopath to the necessary questions that should be posed. In addition, for each acute pathology, the user has access to a differential diagnosis based on the keynote symptoms of the main remedies.

## Development of Synapse tool

The Synapse Workflow has two types of grouped rubrics in the form of templates:

A large number of **Common Chronic Pathologies** have been grouped in categories and matched with the appropriate rubrics. **Themes** (groups of rubrics), like *General modalities*, *Weather condition*, *Food preferences* etc., which delineate the basic and most important rubrics for case-taking, were created. Through this tool, the user can get a more complete picture of the patient and identify the correct remedy.

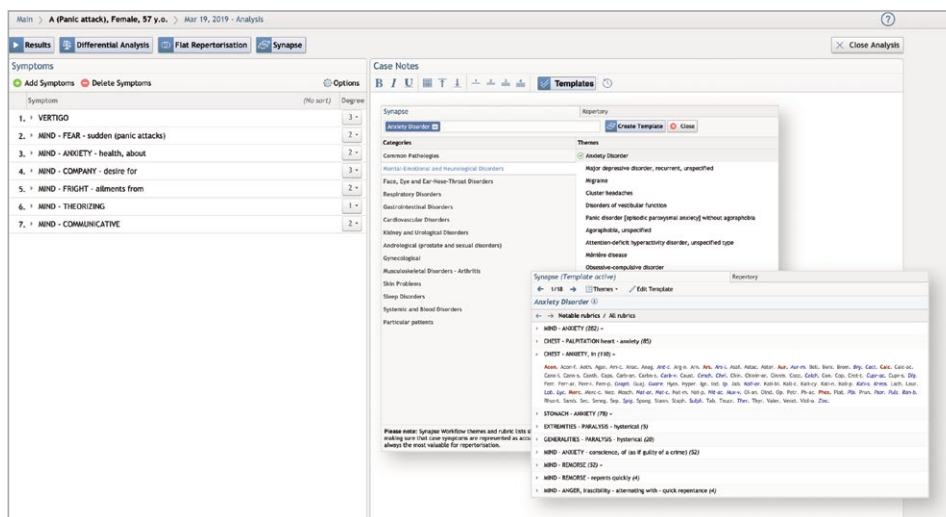


Figure 26: Synapse tool

## Advanced Search Tool

Advanced search is a tool that enables the homeopath to see the symptoms of particular remedy/remedies from all the repertory or from particular chapter(s) and perform comparative analysis. The homeopath can filter the grading so that he/she can see for example the symptoms where the remedy is present only in the 3th, 4th degree and also in a specific rubric size. Advanced search tool can also compare two remedies and bring the common and differentiating symptoms between these remedies.

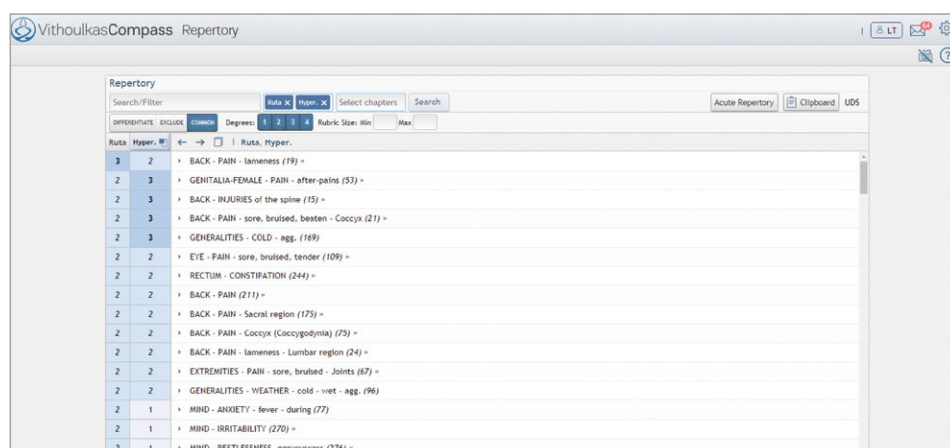


Figure 27: Advanced search tool screen

## Expert system improvement iterations

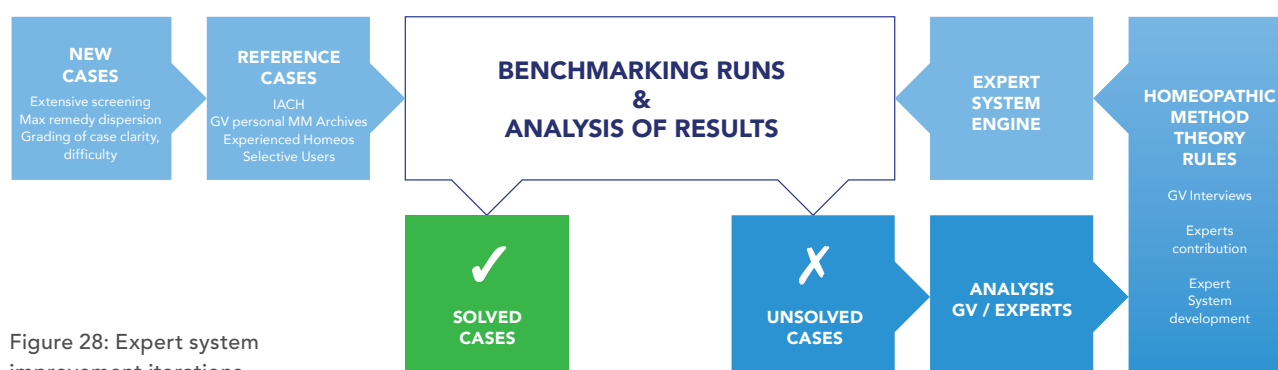


Figure 28: Expert system improvement iterations

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# Research and Development



## Vithoukas Compass Research and Development

### **Principal areas of research include:**

- New and innovative ways to systematize case-taking
- Tools for more effective usage of the repertory and rubric selection
- Knowledge management of homeopathic source materials
- Advanced data statistics
- Homeopathic studies and experiments
- Homeopathic educational tools

The VC team is always open to cooperate with practicing or research parties for the purpose of exchanging data and to participate in projects which promote well-founded homeopathic practice.

## Notes



## Notes

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4 Agias Varvaras street  
152 31 Chalandri, Athens, Greece  
e-mail: [info@vithoulkascompass.com](mailto:info@vithoulkascompass.com)



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