

AktuarMed[®]

The underwriting system
for health insurance



AktuarData

Gesellschaft für aktuarielle Datenbasen mbH
Cologne - Germany

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Gesellschaft für aktuarielle Datenbasen mbH
An der Kemperwiese 3a
D-51069 Köln / Cologne
Germany

E-mail: info@AktuarData.de
Telephone: +49 (221) 96 84 79 - 60
Fax: +49 (221) 96 84 79 - 68

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Executive Directors: Professor Jürgen Weyer, Herbert Fründt
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Computerized underwriting

Objective and transparent



Computerized underwriting represents a revolutionary improvement over conventional underwriting methods. With AktuarMed® and its complex database, however, this is taken one step further. The advantages and operating principles of AktuarMed® are detailed below:

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AktuarMed®

The underwriting system for health insurance

What characterizes AktuarMed®?

AktuarMed® is a unique underwriting system designed for the field of health insurance. AktuarMed®'s basic philosophy is founded on claims-adjusted risk assessments. The risk loadings which are assigned by AktuarMed® are suitable for the purpose of largely offsetting the additional benefits which are anticipated as a consequence of previous illnesses. This enables a health insurer using AktuarMed® to perform calculations on a cost covering and profit-oriented basis. This applies to both new applications and product changes.

Underwriting for all products

AktuarMed® is suitable for examining all types of health insurance products and including their specifications in the risk calculation process.

Transparency due to differentiation of risk loadings

AktuarMed® divides the risk loadings into different illness groups, thus featuring a high degree of transparency. At the point of sale this information, which is currently unique among expert systems, provides an excellent basis for justifying loadings to clients.

Knowledge base foundation

AktuarMed's knowledge base is founded on the evaluation and comparison of the following types of data:

- Anamnestic databases
- Master policy data
- Benefit databases

Various health insurance companies provided all their current and previous relevant data for the purpose of identifying and quantifying the risk of increased claims depending on case history (anamnesis) and personal circumstances. The corresponding data analysis is performed by complex multivariate statistical calculations, neural networks and hybrid methods.

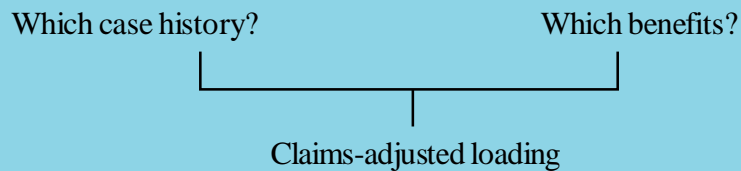
The following prerequisites were instrumental in facilitating the development of AktuarMed®:

- Digital anamnestic database
- Mathematical expertise (in-depth knowledge of multivariate mathematical statistics)
- Adequate evaluation technology for large databases

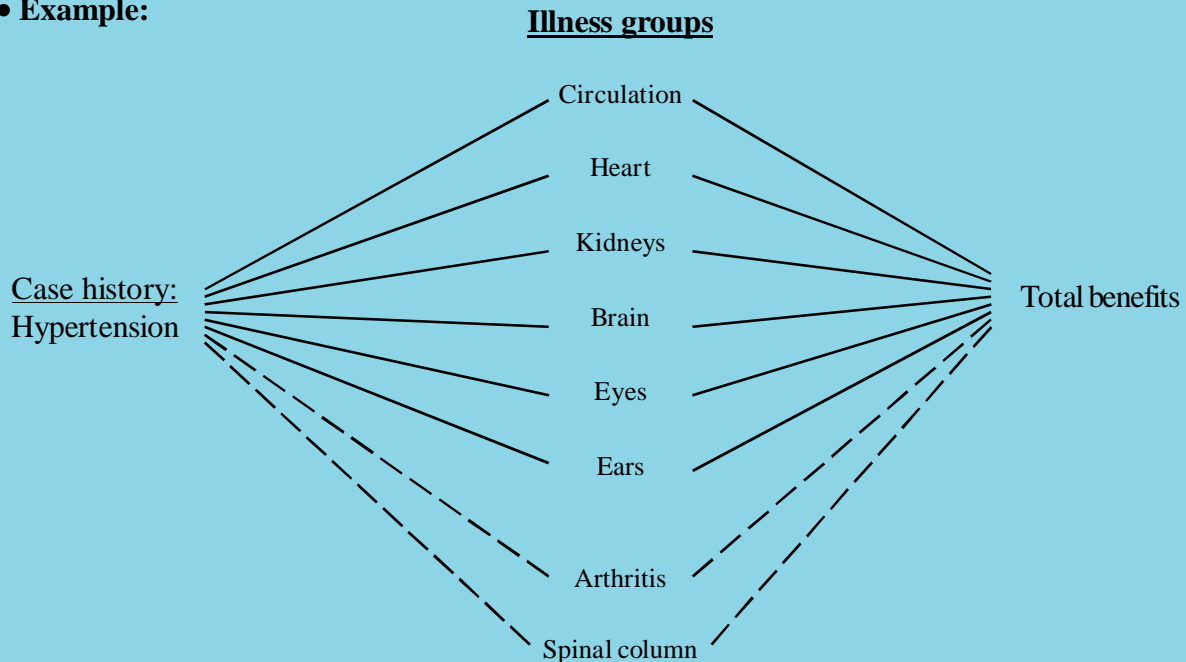
All these elements are readily available from the production company, RISK-CONSULTING Prof. Dr. Weyer GmbH, an affiliated AktuarData GmbH company.

Methodology of claims-adjusted loadings

- **Review:**



- **Example:**



AktuarMed® in practice

The AktuarMed® underwriting system is currently deployed by numerous national and international large, medium sized and small health insurers. Following appropriate modifications and taking into consideration the relevant health systems and typical national products, this underwriting system can be used globally in the local language. For the purpose of deployment in Asia, Africa and Latin America, infectious diseases which are rare in Europe are also taken into account.

Favourable rating on the basis of AktuarMed®

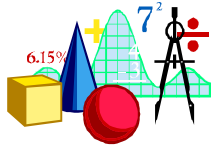
If a health insurer is subjected to rating, the use

of AktuarMed® regularly results in a favourable outcome.

Thus, for example, ASSEKURATA Assekuranz Rating-Agentur GmbH writes: "According to ASSEKURATA, the [company's] underwriting practices are rated very highly. They involve the deployment of a very efficient computer-aided expert system which is able to evaluate medical terms (diagnoses, synonyms, forms of treatment and abbreviations) on a computerized basis. In addition, the system recognizes correlations between different illness patterns and takes them into account when assessing the overall risk. With the aid of this system [the company] is able to process in excess of 90% of incoming applications within a very short period of time without neglecting any of the appropriate underwriting aspects."

Claims-adjusted underwriting

What sets AktuarMed® apart from conventional underwriting systems?



Individual risk loadings

A number of underwriting systems are currently available, though these are pure IT systems with no risk content, meaning that they are essentially nothing more than an empty shell. Before these systems can be utilized, the users themselves need to stipulate risk loadings and risk assessment rules. They merely serve the purpose of standardizing risk loadings. In these systems, the individual applicants are placed into a small number of set groups, despite the fact that the number of combinations of risk-relevant data is far greater. For this reason, these systems require clients to pay the same loading despite the different risks which are involved. However, it is particularly the case that these systems fail to examine sufficiently whether or not the stipulated rules and risk loadings reflect the economic reality.

In contrast, the revolutionary innovation of AktuarMed® is that it is not an empty shell bereft of content, but rather a complex "database" which is rendered accessible by means of a user interface. AktuarMed® can calculate individualized risks, thus producing a wide range of modified risk loadings.

Individualized risk loadings are differentiated according to case history (anamneses), product, age, sex, weight, size and body mass index (BMI) which are calculated on this basis. Since it analyses a large pool of data, AktuarMed® is able to perform long term evaluations of anticipated benefit payments.

In this connection, AktuarMed® establishes cross-links from a wide variety of medical fields and takes them into account for forecast purposes. When a physician examines a patient, this primarily encompasses the distress which the latter is currently suffering. Whereas physicians frequently make the mistake of equating personal distress with resulting health costs, AktuarMed® focuses on the issue which is of interest to the health insurer, namely, benefit payments.

Realistic benefit assessment

Extensive studies conducted on the basis of AXA Krankenversicherung AG's benefit payments and anamnestic databases demonstrate that the standard assessment of the risks which previous illnesses involve from primarily medical aspects deviate from the risk loadings which are actually required, and in some cases considerably so. In particular, a claims-adjusted risk assessment demonstrates that illnesses which, though apparently harmless, develop along chronic lines, are often seriously underestimated in underwriting practice.

The extent of a loading must be based logically upon the actual additional benefit payments which were received in the past by insureds who have suffered from the same previous illnesses. To this end, AXA Krankenversicherung AG's benefit payments and anamnestic databases encompassing numerous observation years were evaluated digitally on the basis of individual settlements.

Multivariate analysis

Using discrimination methods and scoring procedures, expensive diagnoses (previous illnesses) were identified and scored for every benefit sector. These methods and procedures function along multivariate lines and – with a high degree of accuracy – identify not only the risk relevance of individual anamneses, but also interactions between various case histories or additional risk parameters (causality *and* correlation).

A previous illness in connection with other medical disorders or given certain ages may require a completely different risk loading than would be the case under different circumstances.

The calculated risk score was subsequently adjusted in line with the actual benefit expenditure. A medical assessment was only conducted for rare illnesses with no statistical basis.

All statistically relevant anamneses are assessed by AktuarMed® solely on the basis of the payments recorded in the benefit database.

Claims-adjusted global assessment

From the information which is furnished by applicants, AktuarMed® calculates risks on a future-oriented (prospective) and comprehensive basis. AktuarMed® produces a claims-adjusted global assessment grounded on database information. The system invariably reaches a decision.

Ongoing development and adaptation to actual changes

Since the knowledge base underlying the differentiated calculations is continuously reviewed and updated, AktuarMed® facilitates up-to-the-minute risk calculations.

Objective underwriting and standard pricing procedures

What advantages are to be gained by using expert systems in health insurance?

The general advantage of expert systems

- The general advantage of all expert systems is standardized underwriter-independent risk assessment.

However, conventional expert systems do not guarantee output quality. In particular, loadings are frequently inadequate, as the specialists' decisions integrated into these "empty shells" are often statistically inaccurate. In addition, in many cases, conventional systems are completely unable to reach any decisions at all.

Additional benefits which AktuarMed® entails

- Risk-commensurate earnings through the imposition of **claims-adjusted** loadings. For the most part, claims-adjusted risk loadings offset the excess risk which materializes upon the inception of a policy due to previous illnesses
- In particular, claims-adjusted risk loadings are differentiated according to types of previous illness, sex, age, product and retention
- Avoidance of subsequent financial losses as a result of incorrect assessments
- Transparent decisions for clients and sales departments as a result of the differentiation of risk loadings
- Reduction in the number of enquiries from physicians since they are almost exclusively required solely for the purpose of specifying vague medical information provided by the applicant
- Risk assessment standardization also in the event of product changes
- Discernible reduction in administrative costs,



including those arising from the deployment of less specialized personnel

- Significant reduction in the ratio of non-materialized business since processing is accelerated and fewer applications come to nothing
- AktuarMed® encompasses all the knowledge which is necessary for underwriting purposes. This means that there is no need for the laborious manual input of individual underwriting rules, and thus lower implementation costs for companies
- Greater premium stability in the medium term since good risks no longer subsidize bad risks
- Improved competitive position due to positive ratings

AktuarMed's adaptability

Can the knowledge which is contained in AktuarMed® be deployed by all health insurance companies?

AktuarMed® can be adapted for a wide range of companies. The following fine tuning options enable AktuarMed® to be adapted to the needs of any insurance company:

1. Products

- Inclusion of all schemes
- Full-value or supplementary insurance products
- Tailored to national health care systems

2. Risk loading level (calibration)

- Best risks, portfolio average, etc.

3. Acceptance policy

- Benefit exclusion and restriction rules
- Lists for rejections, enquiries and minor illnesses
- Minimum risk loading determination
- Number of pre-existing conditions necessitating rejection
- Rules for applicants who wear spectacles

- Dental health rules
- Age-dependent BMI influence
- Corporate-specific underwriting rules

4. Additional risk policy stipulations

- Inclusion of corporate diagnostic designations as a complement to the WHO ICD code which is implemented as standard practice
- Upgrading and downgrading rules in the event of product changes

Additional possible AktuarMed® applications



AktuarMed® in the field

In addition to being utilized at head offices, AktuarMed® can also be deployed in the field (POS). In this case, AktuarMed® should be linked to the computer programs used by field staff or brokers. This enables virtually all applications to be fully priced (including

loadings) or rejected on the spot. Only in rare medically unclear cases is this procedure superseded by a "background investigation". The strategic advantage which the technical possibility of issuing policies on the spot entails for field staff is self-evident.

Possible additional functions

- Underwriting —————> Life
- Underwriting —————> Disability
- Underwriting —————> Accident
- Additional input —————> Occupation
- Additional input —————> Leisure pursuits
- Laptop-based, context-sensitive case history questions at POS
- Product kits

A success story

The history of AktuarMed®



How did AktuarMed® originate?

AktuarMed® originated in collaboration with AXA Krankenversicherung AG and was developed between 1994 and 2000 by RISK-CONSULTING Prof. Dr. Weyer GmbH, an affiliated company of AktuarData GmbH. AXA Krankenversicherung AG is one of the few insurance companies which has been collecting digital anamnestic data for decades. The differentiated statistical analysis of this data produced the knowledge contained by AktuarMed®. In this connection, the observation of benefit payments over a period of many years facilitated the development of accurate forecasts of future claims depending on pre-existing conditions.

The relevant data will also be regularly analysed in the future, thus ensuring that AktuarMed® will retain its continuity and topicality.

What is AktuarData GmbH?

AktuarData Gesellschaft für aktuarielle

Datenbasen mbH, which is based in Cologne, has been in existence since February 1996. Its Executive Directors are Professor Jürgen Weyer and Herbert Fründt.

They are both qualified mathematicians and actuaries and boast many years' experience, particularly in the health insurance sector.

AktuarData GmbH possesses extensive databases from the field of health insurance. This data can be utilized for epidemiological research and risk analysis, tasks which are performed by its affiliated company, RISK-CONSULTING Prof. Dr. Weyer GmbH, which was founded in 1992.

Why do mathematicians address the subject of underwriting in health insurance?

This is because mathematical skills and advanced methods are essential for analysing the correlations which exist between an anamnestic constellation and subsequent benefit payments.

Suitable for all requirements

AktuarMed's technical design

The four AktuarMed® versions

1. The stand-alone version for PCs and notebooks
2. The mainframe link version (company tailored)
3. The point-of-service version (upon request)
4. The internet version (upon request)

Recommended system requirements:

- Microsoft Windows 2000 (SP 2) / Microsoft Windows XP Professional (Other operating systems on request)
- 800 MHz or higher processor recommended (system with one or two processors); Intel Pentium/Celeron processor, AMD K6/Athlon/Duron processor or a compatible processor is recommended
- 512 MB of RAM or more recommended (a minimum of 256 MB of RAM is required, though the performance of some features might be limited)
- XGA (1024x768) or higher-resolution monitor with at least 256 colours, display setting of 96 DPI
- 300 MB of available hard disk space
- DVD or CD drive (only required for installation)
- Mouse or compatible pointing device

Which services does AktuarMed® provide for its users?

- Regular updates, e.g. featuring
 - Additional diagnoses
 - New functions
 - New statistical findings (some of which entail a separate fee)
- A clearly structured user manual
- A dedicated hotline (upon the conclusion of a service agreement)
- Installation assistance (for a separate fee)
- Training, including on-the-spot training (for a separate fee)

A high degree of user-friendliness

AktuarMed® is simplicity itself

AktuarMed's input masks are transparent, fast and easy to complete. AktuarMed® is practically self explanatory, meaning that little training is needed.

The screenshot displays the 'AktuarMed® - Interactive Risk Evaluation Private Health Insurance' application window. The 'Policy Details' tab is active, showing various input fields for policy information. The 'Products' section on the right allows for selecting and managing different insurance products. The interface is clean and organized, with clear labels and intuitive navigation.

Virtually no specialist medical knowledge is required to be able to enter case history data, since AktuarMed® features many synonyms for specialist medical terms.

The 'Add Condition' dialog box provides a structured way to add medical conditions to a patient's history. It features a searchable list of conditions with their corresponding ICD codes and disease groups. The filtering options allow users to narrow down the list based on specific criteria, such as the ICD code, duration of the condition, and its status (e.g., current illness, previous operation). The interface is user-friendly and designed to facilitate data entry for non-specialist users.

AktuarMed[®] at a glance

- Risk loadings in accordance with actual benefit payments, claims adjustment, for rare illnesses, computerized assessment in accordance with conventional medical principles
- Loadings / exclusions in accordance with claims expectations
- Multivariate risk assessment
- Loadings dependent on anamnesis, product, age and, optionally, sex, BMI, occupation, region and family case history, etc.
- Differentiated display of risk loadings, benefit exclusions and rejections
- Alternatives with and without benefit exclusions / restrictions
- Product-change module
- Previous illnesses pursuant to ICD codes (WHO), plus a thesaurus
- Search function:
 - Filter functions
 - Text fragments
 - Orthographical tolerance
 - Synonyms
- Control parameters in line with an insurance company's risk policy, i.e. "tailored" adaptation in accordance with a company's requirements
- Risk assessment standardization
- Reduction in the number of enquiries to physicians
- Transparency in respect of corporate loading strategies
- No cross-subsidizations, meaning fewer premium adjustments in the medium term and fewer cancellations
- Underwriting also possible using staff with less medical knowledge
- Reduction in administrative expenditure
- Reduction in personnel and material costs
- Shorter processing times, less non-materialized business
- Regular updates
- Immediate responses and decisions
- Stable system behaviour (exception handler)
- PC version (stand-alone)
- Mainframe link
(via interface – upon request)
- Definitive point-of-service underwriting procedures (upon request)
- Internet link (via interface – upon request)

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Gesellschaft für aktuarielle Datenbasen mbH
An der Kemperwiese 3a
D-51069 Köln / Cologne
Germany

E-mail: info@AktuarData.de
Telephone: +49 (221) 96 84 79 - 60
Fax: +49 (221) 96 84 79 - 68

AktuarMed®

医用数学

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