



Straight From the Heart – Can Insurers Help Prevent Cardiovascular Events?

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It is well known that cardiovascular diseases, such as heart attacks, are the major causes of death worldwide (Figure 1).¹ They can be life-threatening and are often experienced by the individual as a warning sign that can lead to lifestyle changes. It is understandable that the insured, who was diagnosed with a heart attack, expects his Critical Illness (CI) cover to pay a benefit. This, however, might not always be the case, depending on the severity level meeting the CI definitions.

This expectation has, in some markets, created pressure for insurers to offer CI products based on diagnosis-only definitions. In that case, a benefit is paid for every heart attack diagnosed by a medical professional, irrespective of the severity of the event. But paying each claim for heart attack is not always in the best interest of all insureds because claims payments that exceed the insurable interest lead to higher than necessary premiums.

We have seen enormous medical progress in cardiovascular disease in the past decades. Treatment of heart attacks has improved, so they often cause less harm than they would have caused 30 years ago. The Swedish Heart Failure Registry, which conducts detailed analyses of heart attack incidence and mortality annually, found that the 365-day mortality after a heart attack dropped from almost 20% in 1995 to less than 10% for the years 2007 onwards.² This reduction reflects not only improved treatment but also changes in the detection of heart attacks. With biomarker tests, namely troponin and more recently high-sensitive troponin, heart attacks can be detected earlier and more accurately than before, which results in earlier and more precise treatment. Before the introduction of troponin, some heart attacks that did not cause ECG changes or showed unclear changes (NSTEMI) were classified as Angina Pectoris (chest pain).³ Afterward, the proportion of full thickness infarctions of the heart (so called STEMI), which are predominantly defined by ECG changes and less by raised troponin levels, dropped significantly over the past years. The increasing numbers of diagnosed NSTEMI's are mainly responsible for this reduction. A higher proportion of – on average – less severe NSTEMI infarctions, better diagnostics and therefore more precise and faster treatment have all contributed to the observed reduction in heart attack mortality. There are now several cases where the pumping function of the heart – the ejection fraction (EF) – is not significantly reduced after a heart attack.

At the same time, the incidence rate stagnated or declined in many countries in the past decades.⁴ A major cause of the reduction is likely the decline of smoker rates in

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About This Newsletter

Claims Focus is aimed at life/disability claims assessors and addresses various aspects of modern claims assessment – facts and trends relating to the international claims assessment scene, details of important illnesses, case depictions and information on day-to-day claims assessment practice for various products.

many countries. But the potential gains from smoking cessation are not endless and, in several countries, we see that progress is slowing. Negative effects of the modern life style, with its oversupply of calories and lack of physical activity, weigh heavily against positive effects from smoking cessation (Figure 2).

Heart attacks have been and still are a major health threat

Between 1980 and 2015 the prevalence of obesity more than doubled on a global scale, affecting both developed and developing countries.⁵ As a result, we observe a pandemic of obesity, hypertension and diabetes posing a major threat to cardiovascular health.

To sum it up: Heart attacks have been and still are a major health threat. The demand for diagnosis-only benefits is understandable, but insuring every claim comes with high risks of future changes. Outcomes continue to improve, which means that the negative impact on the quality of life after a heart attack will decrease and therefore the necessity for an insurance cover

of a heart attack with a very good outcome becomes questionable.

What can be done?

First things first means finding a common denominator between

customer expectations and needs. What does the customer need the product for? In some markets CI cover is used as an add-on for health insurance. In this case, the policy needs to cover all acute heart attacks to provide a reimbursement-like benefit. But even though there is customer demand for the expensive pay-all-diagnoses approach, it is still a risky venture for the insurer, especially with guaranteed business. Stepped benefits can help in this case to limit costs for minor events.

In markets where CI is used to cover debt and the long-term lack of income after a severe infarction, a more robust definition can be in the interest of the policyholder as it leads to more affordable rates.

The general product setting is also important. Is it a product with long durations and guaranteed rates? Then the risk of change and its impact on different severity levels in the definitions must be considered. We have the risk of increasing incidence rates due to lifestyle, which affects any definition. There is also a trend to improved detection of heart attacks, which can lead to more claims for weak definitions only. A further shift to less severe heart attacks could improve outcomes for stricter definitions but would not change the experience for weak definitions. For these reasons, stricter definitions can be preferable for products with long term guarantees.

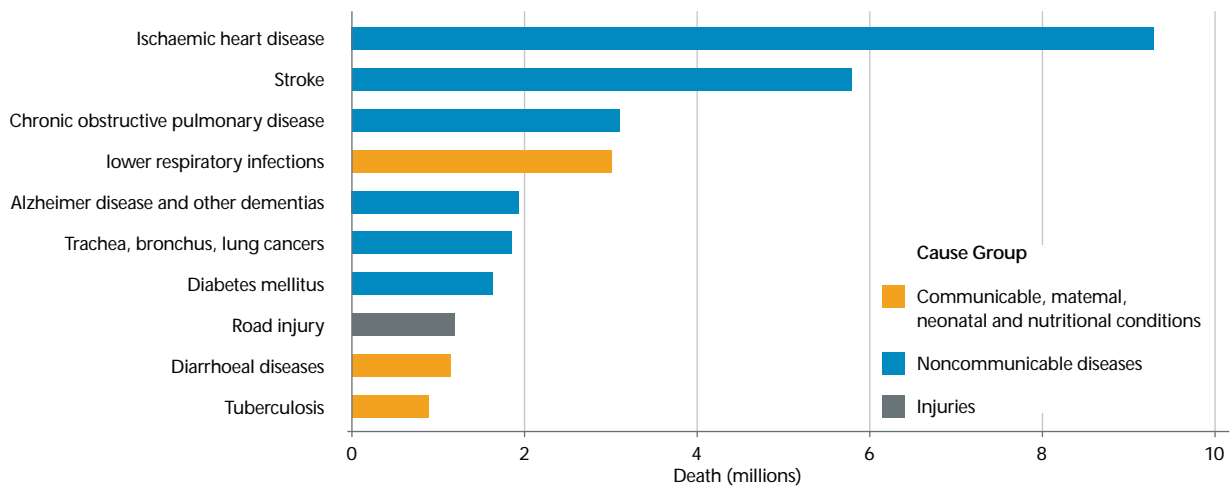
For a market operating under standard definitions set by the regulator, the potential to change the disease wording itself is limited and the insurer may be required to offer definitions with low to none severity levels. To limit the exposure to certain risk factors, other product features, such as the maximum sum insured or the duration of the contract, can be reduced.

Generally, the insurer should always look for outdated or unclear elements. The best way to ensure that the customer's expectations match the insurance cover is to have transparent and easy to understand definitions with clearly stated severity requirements for the benefit payment. Ideally, the definitions are reviewed regularly to depict the changes in medical definitions and treatment standards.

What are possible thresholds?

In some markets, we observe definitions where only STEMI infarctions are covered. This is a clearly defined severity level, but as the proportion of STEMI on all infarctions has decreased significantly in many markets, this may be considered as too restrictive. Also, while STEMI has a significantly higher 30-day-mortality than NSTEMI,⁶ the long-term effects are similar.⁷ While STEMI infarctions theoretically pose a transparent severity criterion, the similarity in long-term mortality and symptoms may still result

Figure 1: Top 10 global causes of deaths, 2016



Source: Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2016. Geneva, World Health Organization; 2018

in the customer feeling treated unfairly if he suffers from a severe NSTEMI.

Some definitions use troponin thresholds. These allow, from a medical point of view, a much more detailed differentiation between heart attacks. However, most laymen have hardly ever heard of troponin, let alone understand the implication of different troponin thresholds, so for laymen the transparency of such a definition is questionable. The positive side of these thresholds is the clear criterion for a medical professional, the negative side is the necessity of explanation by a medical professional for the laymen to understand the cover. Additionally, the time that passes between the heart attack and the measurement of the troponin level will impact the magnitude of the troponin substantially, which makes it even more difficult to use a fixed troponin value as a clear cut off point for a decision about a claim. In the past it was more common to measure serial troponin, which gave a detailed picture of the magnitude of the peak. Nowadays serial troponin is not routinely measured, in which case we only observe an excerpt of the curve, which may or may not be the peak. Hence, good policy wording includes changes in troponin, etc. but does not exclusively relate a fixed troponin threshold.

Procedure vs Surgery

The term “procedure” describes any method for performing a task.

A “surgery” is a procedure involving major incisions to remove, repair, or replace a part of a body. So, every surgery is a procedure, but not every procedure is a surgery. For example, the insertion of stents or balloon angioplasties neither remove, repair nor replace a part of a body but rather insert something to assist the weakened part. They are therefore procedures, but they are not surgeries.

Minimally invasive surgeries, as the name implies, fulfill the condition to be a surgery because they are used to remove, repair or replace part of a body.

It can be difficult for the claims department to decide whether or not the policyholder has a justified claim for a heart attack. Neither clinical symptoms, nor ECG changes nor troponin alone can determine a heart attack with certainty. Even if the combination of all three indicates a heart attack, there are still cases where differential diagnoses must be excluded.⁹ We therefore suggest that to be understandable, a definition should differentiate between the attack itself and its sequelae. Wall motion abnormalities or a reduced ejection fraction can be good criteria to differentiate between minor and major heart attacks. Focusing on the long-term outcome of a disease makes it easier to explain why some events are covered and others are not. Policyholders can understand that a permanent and significant loss of

heart function requires more financial protection than a minor infarction that allows the policyholder to go on with life as before the event.

”Differentiation between minor and major heart attacks is important

If the definition contains limitations, it is important that these are communicated transparently and are not hidden in the small print. Only then will the consumer be able to make an educated decision and have the awareness that not every event is covered. This will reduce the number of unjustified claim requests and hence reputational risk for the insurer.

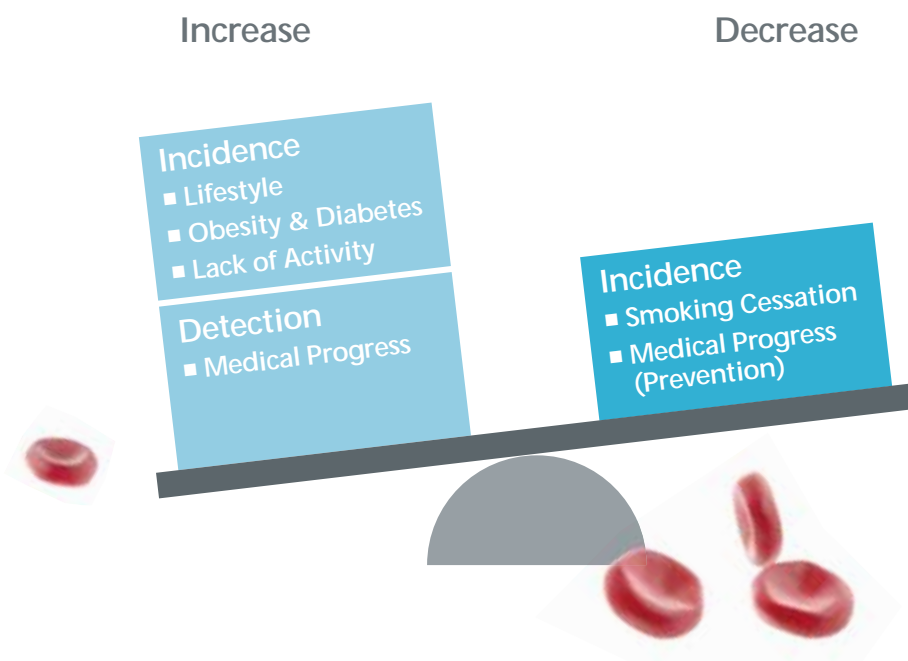
A different picture for surgeries

Heart surgeries, such as coronary artery bypass grafts or heart valve repairs, are often included in CI covers and they, too, are affected by medical progress.

Many Critical Illness definitions require open-chest surgery as a benefit trigger, but nowadays this treatment is not always the best option from a medical point of view, given alternatives such as minimally invasive surgeries, and “non-surgical” procedures such as the insertion of stents. When reviewing the cover of surgeries in a CI context, questions the insurer can ask are:

- Is the treatment still a critical intervention that is comparable to other CI's and how will it impact the quality of the insured's life?

Figure 2 : Factors with impact on the detected incidence of heart attack



- Is there a major risk of strongly increasing surgeries in the future if new techniques are accepted?

Many conditions that used to be treated by open-chest surgery, could technically be declined for coverage today when treated differently. As the severity of the underlying condition has not changed, it can be argued by the policyholder that this is overly strict. Minimally invasive surgery is used when the insured's health is not fit to sustain open-chest surgery and vice versa. That does not mean that minimally invasive surgery is the generally preferred option, rather that treatment is based on many individual factors. For example, the duration of minimally invasive surgery is often longer than that of open-chest surgery, resulting in more time under anaesthesia, which is not an option for everyone. It can then be better to use open-chest surgery even though that brings other risks through higher blood loss and longer recovery periods. The underlying condition leading to minimally invasive surgery can be better, similar or even worse than that leading to open-chest surgery. Therefore, it can be argued that CI insurance that covers open-chest surgery should also cover minimally invasive surgery.

Non-surgical procedures present a different picture. Non-surgical procedures, such as the insertion of stents, are increasingly used in lower stages of cardiovascular diseases and do not display typical CI features, such

as long-term effects or high risk. Such a procedure can be a precautionary measure while the insured is still in decent health, but it neither displays a comparable risk to the surgeries that are covered in a CI policy, nor does it generally require long recovery periods. For example, a bypass graft has a recovery period of approximately 12 weeks with extensive rehabilitation training,⁹ whereas after the insertion of a stent, the patient can leave the hospital usually within 24 hours.¹⁰ For these reasons we would advise offering only partial benefits – if any – for non-surgical procedures in a CI product.

Preventing cardiovascular events

The best heart attack is the one that does not happen, and by now insurers have more and more chances to play their part in prevention. As discussed in the first section of this article, we are aware of many risk factors – obesity, diabetes, lack of physical activity or smoking – that have a negative impact on the insured's cardiovascular health.

An increasing number of products incorporate prevention or lifestyle elements; for instance, measuring step count or other physical activity, or even incentivizing or nudging the policyholder toward a healthier lifestyle. As of now no comprehensive studies quantify the effect of increases in physical activity on improving the insured's health status. Still, from what

is available, it is safe to assume that incentives for a better lifestyle will have a positive effect on health. Plus, healthy people with a high level of physical activity may be more inclined to buy a product with life-style incentives – this might also reduce the number of claims in the portfolio.

Insurers have chances to play their part in prevention

Some CI policies also offer small benefits for the diagnosis of diabetes. Such a benefit can be useful for the insurer, as an earlier diagnosis leads to early treatment, which is important for avoiding or at least delaying secondary diseases, such as heart attack, stroke or blindness. This diagnosis benefit can be combined with further benefits if the disease is well-controlled. Unlike life-style benefits, there is a certain risk that such a prevention benefit attracts lives with less-than-average health status, so the amount payable and other elements – such as sales channels – need to be balanced.

Both the life-style benefit and the early diagnosis benefit can lead to an improved communication with the customer, which is valuable. The insurer learns more about the customer and can use the information for enhancing his or her offers to the



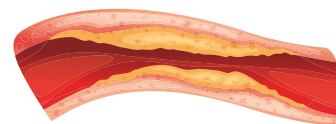
customer. In turn, the customer has a strong partner with aligned interest who helps to prevent diseases or their sequelae. In a nutshell, medical progress has drastically changed the appearance of cardiovascular diseases in the past few decades and this has not left the definition-based product CI insurance untouched. The various needs in different markets and of different customers do not allow a one-size-fits-all solution, but strategic decisions help to manage the different demands. While sedentary lifestyles can lead to problems not only for insurers but the whole society, increased client interaction and prevention tools give insurers a chance to play their part in helping their customers to lead a healthier life.

Gen Re has been involved in the product design and definition of CI insurance since the launch of the first product. Please do not hesitate to contact us if you are looking for a partner at eye level for your product development.

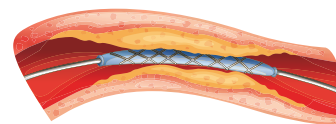
Endnotes

- 1 <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>.
- 2 SWEDHEART Annual Report 2018, p.78 (Figure 103: Trend in mortality in MI patients <80 years).
- 3 Pell et. al, Impact of changing diagnostic criteria on incidence, management, and outcome of acute myocardial infarction: retrospective cohort study, *BMJ* 2003; 326: 134–5.
- 4 Roth et al., Global Burden of Cardiovascular Diseases 2015, *JACC* Vol.70, No.1, 2017, p.10.
- 5 GBD 2015 Obesity Collaborators, Health Effects of Overweight and Obesity in 195 Countries over 25 Years, *10.1056/NEJMoa1614362*.
- 6 SWEDHEART Annual Report 2018, p. 25 (Figure 12: Mortality in MI patients, in relation to ECG).
- 7 Comparison Of Short- And Long-Term Mortality Between St-Segment Elevation And Non-St-Segment Elevation Myocardial Infarction; Hidenori Yaku, Hiroki Shiomi, Takeshi Morimoto, Yugo Yamashita, Yutaka Furukawa, Yoshihisa Nakagawa, Kenji Ando, Kazushige Kadota, Mitsuru Abe, Miki Shinji, Satoshi Shizuta, Koh Ono, Takeshi Kimura; *Journal of the American College of Cardiology* Apr 2016, 67 (13 Supplement) 50; DOI: 10.1016/S0735-1097(16)30051-1.
- 8 4th universal definition of myocardial infarction.
- 9 <https://www.mayoclinic.org/tests-procedures/coronary-bypass-surgery/about/pac-20384589>.
- 10 <https://www.mayoclinic.org/tests-procedures/carotid-angioplasty-and-stenting/about/pac-20385111>.

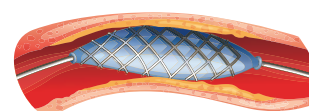
Stent with Balloon Angioplasty



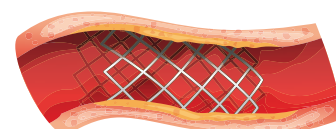
- 1 Build up of cholesterol partially blocking blood flow through the artery



- 2 Stent with balloon inserted into partially blocked artery



- 3 Balloon inflated to expand stent



- 4 Balloon removed from expanded stent

About the authors

Tim Eppert is an Actuary and heads Gen Re's Competence Centers for Critical Illness and Health. He joined Gen Re in 2005. Within the Research & Development department, Tim's team provides product solutions globally and facilitates the sharing of expert knowledge. He has a focus on expanding insurability to substandard groups and putting digitisation into life insurance product. Tim is a member of the German Actuarial Society (DAV). He can be reached by telephone on +49 221 9738 579 or by sending an email to tim.eppert@genre.com.



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