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The sufficiency of the minimum amounts in compulsory liability insurance to cover personal injury claims – based on motor third party liability insurance and medical liability insurance

The main role of the liability insurance is to protect the insured person or entity against the financial consequences of the potential claims that can be consequences of the events for which the insurance holder is responsible and which they are obliged to repair; on the other hand, it protects the third parties. However, it should be noted that the responsibility of the insurer is limited by the amount of cover defined in the contract. The aim of the paper is to investigate whether these amounts are sufficient to cover potential claims made by victims. The authors will focus on personal injuries, which are mainly connected to disability benefits, as this is the field where the highest compensation are paid, especially connected to annuities. The analysis will be based on the results of simulations of annuities conducted on cases divided by gender, age of the victim, and selected European countries. The results will be compared to minimum amounts of cover in motor third party liability insurance and liability insurance of entity engaged in medical activities.

Keywords: minimum amount of cover, liability insurance, annuities, disability benefits

Introduction

The purpose of this article is to attempt to answer the question to what extent the compensations paid in a form of annuities may be covered by a minimum amount of coverage in liability insurance. The article is devoted to a detailed analysis of the adequacy of the minimum amount

of coverage in two types of liability insurance, i.e. motor third party liability insurance (MTPL) because of the participation in the non-life insurance market, and medical liability insurance (MLI) due to the occurrence of typical personal injury claims, with particular emphasis on the possibility of those claims in case of young people.

Compensation benefits are intended to restore the financial situation of the victim (victims) to the state before the accident and to take into account the economic realities and social environment from which the victims originate. Therefore, the calculations include several assumptions (they will be discussed in the part concerning methodology) that allow for the inclusion of the economic realities typical for the analysed countries in the calculations.

It should be noted that in the preamble to Directive 2009/103/EC (Directive 2009/103/EC of the European Parliament and of the Council from the 16th of September 2009 relating to insurance against civil liability in respect to the use of motor vehicles, and the enforcement of the obligation to insure against such liability; Official Journal of the European Union L263/11) indicated that the “minimum amount of cover for personal injury should be calculated in such a way as to constitute a full and fair compensation for all victims who have suffered very serious injuries [...]”

A similar premise should be fulfilled in the case of MLI. It is worth considering whether the current Polish law realizes the principle of full and fair compensation for all victims of traffic accidents and, even more so, medical malpractice.

Calculations and comparisons will be made for the MTPL in the case of EU countries plus Switzerland and Norway. The analysis also includes Ukraine and Belarus, due to their close proximity to Poland as well as a significant communication traffic volume and the number of accidents involving the citizens of those countries. In the case of MLI entities, the analysis relates primarily to the countries close to Poland (therefore mainly Central European countries) and those countries whose citizens often visit Poland (with special emphasis on the citizens of Great Britain, who often use Polish dental care).

1. The construction of compulsory third party liability insurance

Liability insurance protects the insured against the financial consequences of potential claims made by individuals or entities to which the insured causes injury and which, according to law, is obliged to compensate for. Damage caused by the insured may have a pecuniary nature (damaged property or lost profits) or personal (death, injury, health disorder), a form of reparation is to cover its financial results.

In the case of personal injury, compensation benefits may include:

- compensations and benefits for the directly affected, like:
 - costs of treatment, rehabilitation,
 - annuities, which should cover loss of earnings and increased needs,
 - compensation for pain and suffering;
- compensations and benefits for the indirectly affected (mainly close relatives), like:
 - funeral expenses,
 - annuities to close relatives (e.g. children),
 - compensation for pain and suffering after the death of a close relative,
 - compensation for the deterioration of living conditions.

Thus, liability insurance protects the insured person's property from having the person or their relatives to cover such claims. It is worth mentioning that the protection extends not only to the existing tangible assets of the insured, but also to their future revenues.

At the same time liability insurance protects third parties who are injured as a result of events for which the insurance holder is responsible. They give a sense of security and provide greater certainty of receiving future benefits, as victims can receive these benefits not from the person directly responsible for the loss, but from the insurance company, which takes over the such obligations. A great advantage is also the independence of payment of benefits from the lifetime of offender, this is important especially when the perpetrator is an older person, and the compensation is to be paid in the form of an annuity for a young person.

It should be remembered that the responsibility of the insurer regarding the insurance liability is limited by the amount of coverage defined in the insurance contract, representing the limit of liability for one and/or all events during the insurance period. Thus, the insurance company pays claims up to the amount of coverage and financial security of the perpetrator is limited to that amount. The problem of depletion of the amount of coverage, indicated in the title, is important especially in the case of personal injury compensation.

1.1 Motor third party liability insurance

MTPL insurance has a different construction depending on the legal system in force in the country and whether the focus is on the protection of victims or perpetrators. In addition, this insurance can be "assigned" to a vehicle (in which case it includes the responsibility of every person who causes injury to third parties while driving this vehicle) or to a driver, in which case it covers civil liability of the driver; mixed variants are also possible. Due to the prevalence of traffic accidents and a large number of people injured in them, in many countries this is a mandatory insurance. This solution is typical for European countries.

In Poland, this type of insurance is compulsory, as regulated by the Act of 22nd May 2003 on compulsory insurance, Insurance Guarantee Fund and Polish Motor Insurers' Bureau.

The Polish motor insurance market is also affected by legal regulations of an international character in the form of so-called communications directives¹. They require individual EU Member States to introduce harmonized solutions for third party liability insurance of motor vehicles.

From the 11th of June 2012 the amounts of coverage in the compulsory motor third party liability insurance are set at the following levels: 5 million euro for personal claims and 1 million euro for damage to property for one event whose consequences are covered by insurance, regardless of the number of victims.

It is worth noting that the Directive also allows the solution where in the case of personal injuries a minimum amount of coverage is 1 million euro per victim instead of 5 million euro per event. These amounts represent minimum values for the amounts of coverage. Member States may choose one of the proposed solutions (in most EU countries there is a limit set on one event

1. M. Monkiewicz, *Regulacyjna baza jednolitego rynku ubezpieczeń Unii Europejskiej*, [w:] *Jednolity rynek ubezpieczeń w UE, Procesy rozwoju i integracji*, ed. J. Monkiewicz, Oficyna Wydawnicza Branta, Bydgoszcz-Warsaw 2005

regardless of the number of victims, while in the Czech Republic, for example, the minimum amount of coverage for personal injuries is set at 1 354 800 euro per victim).

Member States may also establish their amounts of coverage in MTPL insurance on a higher level, e.g. in Switzerland the minimum the amount of coverage for personal claims is 50 million, and in Spain 70 million euro per event regardless of the number of victims. They can also use the solution where the insurer's liability is not limited. Such a solution is used e.g. in Finland, France, Ireland, Luxembourg, Norway, Great Britain.

1.2 Insurance liability of providers of medical services

The framework of compulsory insurance of civil liability for providers of medical activities was recognized in the art. 25 of the Act of 15th April 2011 on medical activity (consolidated text in the Journal of Laws of 2013, pos. 217) and issued on the basis of the Regulation of the Minister of Finance of 22nd December 2011 on compulsory insurance of a civil liability entity engaged in medical activities (Journal of Laws of 2011, no. 293, item 1729).

Moreover, the general rules subject to mandatory insurance are specified in the Act of 22nd May 2003 on compulsory insurance, Insurance Guarantee Fund and Polish Motor Insurers' Bureau (Journal of Laws of 2013 jt. Pos. 392). In accordance with paragraph 1 art. 25 of the Act on medical activity "contract of liability insurance covers damages resulting from providing health care services or from an unlawful omission from providing health care services."

This means that the insurance covers the following:

- the consequences of erroneous actions made as a result of healthcare services by a doctor or dentist performing medicinal actions,
- the consequences of situations where the doctor or dentist did not provide medical services despite their obligation to do so,
- the consequences of situations where the doctor or dentist prematurely withdrew from the performance of medical services.

At the same time it should be emphasized that the insurance concerns only the damages caused when granting (or due to the omission of) health services. The substantive scope of that insurance has been clarified in § 2 of the Regulation.

The Regulation cited above also indicates the minimum amounts of coverage:

- for individual and group medical practices, there is the PLN equivalent of 75 000 euro (for the dentist practicing in a specific field of specialization, and for doctors in the following fields of medicine: anaesthesiology and intensive care, obstetrics and gynaecology, surgery, neonatology, clinical oncology, orthopaedics and musculoskeletal traumatology, urology, otorhinolaryngology, ophthalmology, emergency medicine) for one event,
- 350 000 euro for all events covered by compulsory third party liability insurance.

The minimum amount of coverage for a therapeutic entity providing hospital services as part of their medical activity is 100 000 euro per event and 500 000 euro for all events.

It is particularly important to emphasize that medical malpractice may occur with patients at a young age (this problem is particularly important for midwives, gynaecologists, paediatricians, but also specialists such as ophthalmologists, neurologists, or otolaryngologists treating children). This results in a long-term financial liability, because such an annuity may be paid for about 70 years and is a big financial burden for the offender. For example, it is worth to analyse the ruling

of 8th February 2006 by the Court of Appeal in Poznań. Due to a defective delivery, a baby suffered heavy 4-limb cerebral palsy. The family was granted compensation in the amount of PLN 477,000 (including compensation for pain and suffering in the amount of PLN 300,000) and a monthly annuity in the amount of PLN 2,800 for the injured child. The equivalent of the annuity payments in euro was EUR 680 (per month). The present value of an increasing annuity for the boy is EUR 390 513 and for the girl it is EUR 419 088. It shows that the annuity given to a victim of a medical mistake that occurred at birth is a staggering cost for the doctor (or hospital). It should be noted that the amount of 680 euro per month in 2006 accounted for 1.3 times the average wage in the Polish economy. Unfortunately, the minimum sum of a guaranteed liability insurance in Poland does not cover this amount, as it constitutes less than 20% of the present annuity value.

2. Methodology

According to the Polish Civil Code, art. 444–447, annuities are paid by the insurer in two cases:

- to the directly injured (disability annuities) – should cover the loss of income and increased needs; in most cases the annuity has to be paid for life;
- to close relatives (compensation for the loss of income due to the death of the victim) – annuity paid for life, till adulthood, or till the end of education.

In both cases, similar models are applicable. It is therefore worth mentioning the most widely used models of annuities, and to discuss their most important components. In addition, due to the fact that the calculations are to be made for many countries, it is also important to discuss and identify those elements in which it is necessary to simplify or to adopt additional assumptions due to the lack of consistent data.

2.1 Annuities models

Here are the best-known models of annuities derived from financial and actuarial mathematics, which may constitute the basis for calculating the present value of pension benefits. The following formulas apply to the annuities when the amount of each payment is equal to one monetary unit or, in the case of increasing annuities, when the amount of the first payment of annuity is equal to one monetary unit. In each of these cases, the present value of annuity is equal to the product of the appropriate multiplier and the amount of a single (or first) payment. All formulas relate to annuities paid at the beginning of each period:

$$\text{n-payment annuity due:} \quad \ddot{a}_n = \frac{v^n - 1}{v - 1} \quad [1]$$

$$\text{perpetuity due:} \quad \ddot{a}_\infty = \frac{1}{r} \quad [2]$$

$$\text{n-payment geometrically increasing annuity due:} \quad l\ddot{a}_n = \frac{[1+r]^n - [1+i]^n}{r - 1} \quad [3]$$

$$\text{term life annuity due:} \quad \ddot{a}_{x:n} = \sum_{k=0}^{n-1} v^k {}_k p_x \quad [4]$$

$$\text{term life geometrically increasing annuity due:} \quad l\ddot{a}_{x:n} = \sum_{k=0}^{n-1} [1+i]^{k-1} v^k {}_k p_x \quad [5]$$

whole life annuity due:
$$\ddot{a}_{x:n} = \sum_{k=0}^{\omega-x} v^k {}_k p_x \quad (6)$$

whole life geometrically increasing annuity due:
$$I\ddot{a}_x = \sum_{k=0}^{\omega-x} (1+i)^k v^k {}_k p_x \quad (7)$$

where: ${}_k p_x$ – probability that x-year-old person will survive another x years
 $v = \frac{1}{1+r}$ – discounting factor, where r is an interest rate,
 i – annuity indexation rate,
 ω – maximum age in life tables,
 n – number of annuity payments.

Naturally, these models do not exhaust all possibilities, and a number of interesting ideas can be found e.g. in Bryan and Linke² (calculations based on the length of working life and fluctuations in the labour market) or Dębicka³.

2.2 Assumptions and data

As mentioned before, it is worth discussing the key elements of the annuities models. The basis for determining the value of annuity should consist of two components: the amount of a single payment and the method of indexing. The basis for calculating payments in the annuity can provide, as a general rule:

- in the case of an employed person – a current net salary or loss of salary in case of loss of its parts,
- in the case of a person working under civil law contracts, in the case of a self-employed person, running their own business or with an agricultural holding – an average net income,
- in the case of a person without income (e.g. unemployed, unqualified) – the minimum net wage in the economy,
- in the case of minors, students – the average net wage in the economy.

In the case of the first two groups, this approach seems natural and widely used, because an accident causing incapacity to work should not worsen the financial situation of the victim. The discussion, however, appears when it comes to determining the amount of benefits for the unemployed. There is no possibility of directly indicating the value of the lost income.

During the calculations of an annuity, it should be assumed that an unemployed person could potentially take up a job in the future, but as a result of an accident there is currently no such possibility.

Annuities are calculated at the level of the average net wage. The first payment should be equal to the average net salary in each country in 2012.

Therefore, it may be useful to adopt the following principles as a basis for disability benefits:

- In the case of long-term unemployment – the minimum wage in the economy,

2. Bryan, W. and Linke, C.M. [1988], *The estimation of the age/earnings profiles in wrongful death and injury cases: comment*, The Journal of Risk and Insurance, vol. 55 (1), p. 168–173

3. Dębicka J. [2012], *Modelowanie strumieni finansowych w ubezpieczeniach wieloletnich*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu

- In the case of persons having short-term interruptions in employment – the average net salary in their last period of employment.

Another group are minors and adult individuals, still learning, who have not yet taken up employment. In their case, it is not possible to determine even the indicative amount of income which they would achieve; also, it cannot be assumed that these people would earn income at the lowest level. Therefore, it seems reasonable to adopt the average net wage in the economy as a basis for annuity.

In Poland, the tax issues related to compensation benefits are not fully resolved by the Treasury. It is understood, however, that, as a general rule, if compensation or benefits are obtained on the basis of a ruling or court settlement it is exempt from tax. However, the situation is different if the benefit is based on lost opportunities and income received in connection with conducted business activities. For the purposes of the calculation it was assumed that all payments are exempt from the fiscal burden (among other things, because we have not analysed how the amount of benefits was determined, and what was the source of the victim's income before the accident).

Another question is whether the basis for the calculations should be increased by the amount of social insurance contributions. The greatest burden is a pension contribution of about 20% of the gross salary. If the premium is an element of benefit paid by the insurer, consequently the victim should pay this contribution to the social security system.

Thus, upon reaching the retirement age, the victim acquires the right to benefits from the social insurance system. The annuity received from the insurer would be unjustified because the insurer has already "financed" the victim's pension (by providing the funds for a systematic payment of contributions for the pension insurance in the social security system). In this case, in the calculation made for the purpose of this article, the annuity paid by the insurer should be treated as a term life annuity, paid until the victim reaches retirement age.

Another way to solve this problem is to assume that the victim receives an amount corresponding to net earnings, but the insurer is obliged to provide funds for the maintenance of the victim until the end of the victim's life, because in this variant, the victim will not receive pension benefits from the social security system. This approach was used in the article.

Disability and/or disease pension contribution represent approx. 10% of gross salary⁴. The benefits that can be derived from disability insurance are largely associated with the risk of losing the ability to work by a professionally active person (e.g. an occupational disease, an accident at work). Simulations concern the situation when the victim is unable to undertake economic activity and therefore can no longer do their job, therefore paying contributions in this respect is impossible.

The fourth issue concerns contributions towards health insurance. The person receiving an annuity may independently join the health insurance system. The fee is, in Polish conditions, about 90 euro (currently, in the second quarter of 2015, it is 340 PLN).

Due to differences in social and fiscal systems of different European countries, there need to be calculations of the amount of annual net income (NetSalariesNat100AW) for each of the analysed countries (by Eurostat and national sources – Belarus and Ukraine).

When discussing the indexing of benefits, it must be remembered that the indexation should maintain the real value of pension benefits as well as reflect the future potential growth in net

4. In Poland, disability pension contribution represents 8.00% of the base salary, and disease contribution represents 2,45% of the base salary.

income. Firstly, the granting of benefits should be indexed to the inflation rate. This, however, is insufficient, since it should be considered that the income of the victim could be changed, in particular, to increase its real value. The indexation of the real growth rate of disability benefits should therefore also be taken into account by considering the wage growth in the economy. This rate may, however, be reflected in different ways depending on the victim's membership in any of the abovementioned groups, and possibly on the industry in which the victim has been employed.

In case of an employed person, for someone working under the relevant civil law contracts, self-employed, running their own business or having an agricultural holding, a typical real growth rate of wages can be assumed as the rate of wage growth for the whole economy. However, in a situation where the victim has been employed in a specific sector of the economy, for which there is a published rate of wage growth, real wage growth can be assumed to be the indicator for this sector. In case of the provision in the amount of the net minimum wage in the economy, real wage growth is expected to be compatible with the rate of increase of minimal wages. In case of the provision at the level of the average net wage, indexing shall be consistent with the growth rate of wages in the economy.

In the calculations, the annual indexation of benefits was assumed by the rate of wage growth (the trend in wage growth) as equal to 1.8% (this rate is similar to the average growth rate of wages in the EU in the years 2002 to 2013 – for the EU 27 it reached 1.86 %, for the EU 25 1.77% – based on Eurostat data). Due to the lack of availability of consistent data in the countries outside the EU adopted for the analysis (Belarus, Ukraine), data from these countries is not included in calculation of the above-mentioned level of indicator.

It was assumed that the pace of payment increase will be constant throughout the period of payments, therefore we assume a geometric increase of payments. This assumption may not exactly be close to reality in practice, depending on the performed profession, level of education, professional position, and age, the remuneration increase factor may be an increasing or a decreasing function.

Another element that appeared for the calculation of life annuities is the probability of a survival period (i.e. the question whether the beneficiary will live till the next payment). These probabilities are the elements of relevant life tables. In the case of annuity for the directly injured party in an accident, and therefore one that suffered bodily injury to a degree that prevents their full return to professional activity, life tables should be appropriately modified compared to the tables for the entire population. For disabled persons the probability of living through the successive periods will be lower than it is presented in the life tables for the whole populations, thus for general tables the obtained results will be overstated.

Life tables used in the calculations are not modified in any way to take into account disability of the person the annuity is paid to. It was decided to use in the thesis the life tables for the whole population of a given country, due to a low availability of life tables for disabled persons in particular countries. The values of the probability of survival were adopted by the life table for each country (the most recent available, for most countries, from 2012 – source: mortality.org).

The present value of annuity has been calculated on the assumption of interest rate r (included in the discounting factor). Its height is based on height maximum technical rates used by insurers in the calculations related to, among others, life insurance. In Poland, the maximum amount of the technical rate is determined and published by the Financial Supervision Commission, and

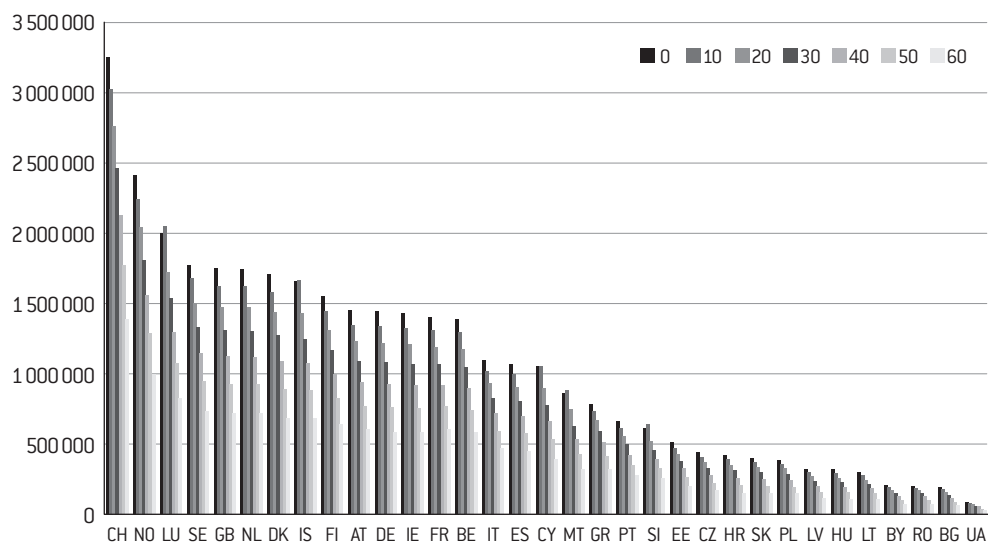
from the 1st May 2015 it amounts to 2.42%. In the calculations, we assumed the value of 3% as similar to the average value of a technical interest rate for the past 10 years.

For the sake of simplicity, we also made the assumption that the annuity is paid once a year, at the beginning of the year. This assumption will slightly overestimate the obtained values, but it will greatly simplify the calculation, because, first of all, there will be no need to make further assumptions about the distribution of life expectancy during the year (e.g. the assumption of the uniformity of deaths per year, the assumption of a constant intensity of deaths, or Balducci assumptions⁵). Secondly, further assumptions regarding the frequency of capitalization in this issue can be avoided (compound annual capitalization is in use).

3. Results and interpretation

As a base for other calculations and interpretations, here are the values of annuities for men and women from the analysed countries for all age categories. For the clarity of the presentation of results, however, they are reduced to selected age groups of 0, 10, 20, 30, 40, 50 and 60-year-olds. The results were presented in graphs 1 and 2.

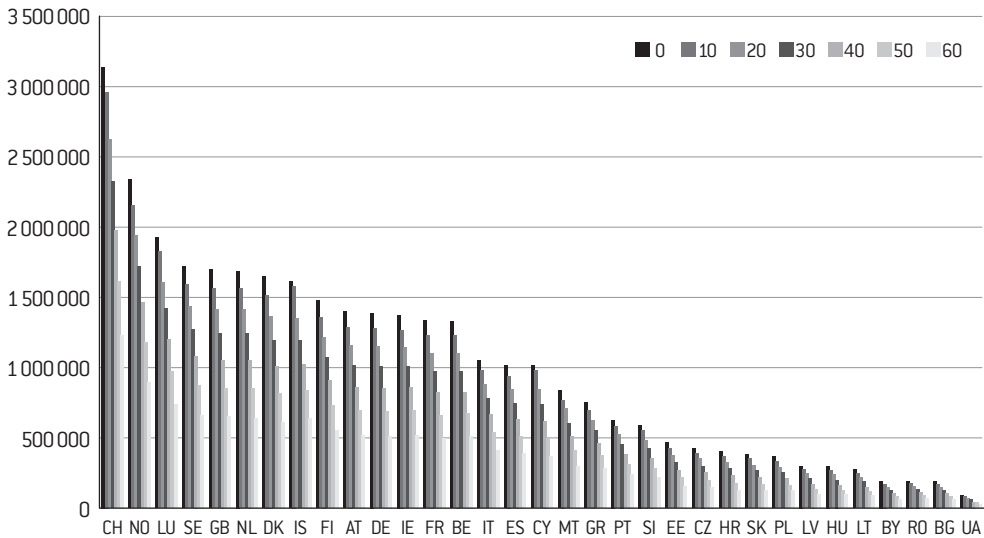
Chart 1. Present value of whole life annuity for different age categories – women



Source: Author's own calculations

5. Kowalczyk P., Poprawska E., Ronka-Chmielowiec W., *Metody aktuarialne*, PWN, Warszawa 2006

Chart 2. Present value of whole life annuity for different age categories – men



Source: Author's own calculations

By far the highest value of the present value of annuities was obtained for highly developed countries. The countries with the three highest values of PV annuity are Switzerland, Norway and Luxembourg. In the 12 countries, the ultimate amount of the allowance for newborns does not exceed EUR 500,000. These results therefore show how important it is to fulfil the condition relating to the need to take into account of the compensation claim the economic and demographic realities of the environment (the country) of the victim's origin.

These results provide the basis for further analysis, where it is worth answering the following questions:

1. For how many typical victims is the minimum amount of coverage sufficient?
2. What is the maximum amount of annuity payment (specifically, the first payment of the pension), where the minimum amount of coverage is sufficient?
3. For how many annuity payments (years) is the minimum amount of coverage sufficient?

In addition, the analysis of the adequacy of the minimum amounts of coverage will be illustrated in case studies.

3.1. What is the number of typical victims for whom the minimum amount of coverage is sufficient?

Due to the alleged differences in the present values of annuities which may be awarded to victims there is a need to learn more about the relationship between these amounts and the value of minimum amounts of coverage in third party liability insurance. By dividing the value of the minimum amount of coverage by present value of annuities, one can obtain the number of persons for whom the annuity may be paid in the amount of the average net wage. These values can also be interpreted in a different way; the information about the extent to which the minimum amount of coverage

covers the annuities for people earning signifies the multiples of the national average. This information illustrates what gives the perpetrators a sense of security regarding personal injuries when they possess liability insurance. Table 1 lists the results for amount of coverage of 5 million euro, while Table 2 contains the results for the amounts of coverage for a specific country.

Table 1. Multiple of coverage of the present value of annuity by the minimum amount of coverage at the level of EUR 5 million for men and women

Country code	Minimum amount of coverage		First annuity payment	Females								Males							
	Per person	Per accident		Age category															
				0	10	20	30	40	50	60	0	10	20	30	40	50	60		
AT	n/a	5 800 000	27 843		3.7	4.1	4.6	5.3	6.4	8.3	3.6	3.9	4.3	4.9	5.8	7.2	9.5		
BE	unlimited		26 794	3,6	3.9	4.2	4.8	5.6	6.7	8.6	3.7	4.1	4.5	5.1	6.1	7.6	10.0		
BG	10 000	30 000	3 899	25.6	27.7	30.7	35.1	41.5	51.6	68.8	27.3	29.8	33.6	39.2	47.8	61.8	83.9		
BY	1 022 584	5 112 919	4 236	23.6	25.6	28.5	32.6	38.4	47.6	63.3	26.1	29.1	33.4	39.5	48.6	63.0	86.9		
HR	n/a	464 045	8 535	11.6	12.6	14.0	16.0	18.9	23.6	31.7	12.4	13.6	15.3	17.8	21.7	27.9	38.4		
CZ	1 354 800	n/a	8 711	11.2	12.1	13.3	15.1	17.7	21.7	28.6	11.7	12.8	14.4	16.5	19.8	25.1	34.0		
CY	n/a	33 540 000	20 434	4.8	4.7	5.5	6.4	7.5	9.3	12.6	4.9	5.1	5.9	6.8	8.0	10.0	13.7		
DK	n/a	14 882 600	33 020	2.9	3.2	3.5	3.9	4.6	5.6	7.2	3.0	3.3	3.6	4.2	4.9	6.1	8.1		
EE	n/a	5 000 000	9 991	9.7	10.5	11.6	13.0	15.1	18.4	24.1	10.6	11.7	13.3	15.3	18.4	23.4	31.7		
FI	unlimited		29 755	3,2	3.5	3.8	4.3	4.9	6.0	7.7	3.4	3.7	4.1	4.6	5.5	6.8	9.0		
FR	unlimited		26 687	3,6	3.8	4.2	4.7	5.4	6.5	8.2	3.7	4.1	4.5	5.1	6.0	7.4	9.6		
GR	1 000 000	n/a	15 145	6.3	6.8	7.5	8.4	9.8	11.8	15.3	6.6	7.2	8.0	9.1	10.7	13.3	17.4		
ES	n/a	70 000 000	20 150	4.7	5.0	5.5	6.2	7.1	8.5	10.9	4.9	5.3	5.9	6.7	7.9	9.7	12.8		
NL	n/a	5 600 000	33 525	2.9	3.1	3.4	3.8	4.4	5.4	6.9	2.9	3.2	3.5	4.0	4.7	5.9	7.8		
IE	unlimited		27 413	3,5	3.8	4.1	4.7	5.4	6.6	8.5	3.6	3.9	4.4	4.9	5.8	7.2	9.5		
IS	n/a	11 984 500	31 619	3.0	3.0	3.5	4.0	4.6	5.6	7.3	3.1	3.1	3.7	4.2	4.9	5.9	7.8		
LU	unlimited		38 254	2,5	2.4	2.9	3.2	3.9	4.7	6.0	2.6	2.7	3.1	3.5	4.1	5.1	6.7		
LT	n/a	5 000 000	5 955	16.6	17.9	19.9	22.6	26.5	32.4	42.1	18.3	20.3	23.1	27.1	32.9	41.9	56.0		
LV	n/a	5 000 000	6 487	15.3	16.5	18.4	20.9	24.6	30.3	39.9	16.7	18.4	21.0	24.6	30.0	38.5	52.2		
MT	n/a	2 500 000	16 872	5.8	5.7	6.6	7.9	9.3	11.5	15.4	5.9	6.5	7.0	8.2	9.8	12.2	16.8		
DE	n/a	7 500 000	27 782	3.5	3.7	4.1	4.6	5.4	6.5	8.4	3.6	3.9	4.3	4.9	5.8	7.3	9.6		
NO	unlimited		46 205	2,1	2.2	2.4	2.8	3.2	3.9	5.0	2.1	2.3	2.6	2.9	3.4	4.2	5.6		
PL	n/a	5 000 000	7 614	12.8	13.8	15.2	17.3	20.2	24.8	32.1	13.7	15.0	16.9	19.6	23.7	30.0	39.9		
PT	n/a	5 000 000	12 683	7.5	8.1	8.9	10.0	11.6	14.0	18.1	7.9	8.6	9.6	11.0	13.0	16.1	21.1		
RO	n/a	5 000 000	4 147	24.1	25.9	28.8	32.8	38.8	48.1	63.8	25.6	28.0	31.6	36.8	44.8	57.4	76.9		
SK	n/a	5 000 000	7 977	12.3	13.3	14.7	16.7	19.7	24.3	32.1	13.1	14.3	16.2	18.7	22.7	29.0	39.4		
SI	n/a	5 000 000	11 926	8.0	7.7	9.5	10.7	12.5	15.2	19.6	8.4	9.0	10.2	11.7	13.9	17.5	23.2		
CH	n/a	50 000 000	61 571	1.5	1.7	1.8	2.0	2.3	2.8	3.6	1.6	1.7	1.9	2.1	2.5	3.1	4.0		
SE	n/a	34 490 300	33 907	2.8	3.0	3.3	3.7	4.3	5.3	6.8	2.9	3.1	3.5	3.9	4.6	5.7	7.5		
UA	9 070	unlimited	1 968	52.1	56.6	63.3	72.7	86.2	107.6	144.7	57.8	64.2	74.2	88.1	107.9	138.9	189.2		
GB	unlimited		33 723	2,9	3.1	3.4	3.8	4.4	5.4	6.9	2.9	3.2	3.5	4.0	4.7	5.8	7.7		
HU	n/a	5 327 620	6 385	15.6	16.9	18.7	21.4	25.4	31.5	41.5	16.5	18.2	20.5	24.0	29.4	38.1	51.2		
IT	n/a	5 000 000	20 834	4.5	4.9	5.4	6.0	6.9	8.3	10.7	4.7	5.1	5.6	6.4	7.5	9.3	12.2		

Source: Author's own calculations

Table 2. Multiple of coverage of the present value of annuity by the minimum amount of coverage at the level different from EUR 5 million for men and women

Country code	Minimum amount of coverage		First annuity payment								Females					
	Per person	Per accident	Age category													
			0	10	20	30	40	50	60	0	10	20	30	0	50	60
AT	n/a	5 800 000	4.0	4.3	4.7	5.3	6.2	7.5	9.6	4.1	4.5	5.0	5.7	6.7	8.3	11.0
BG	1 022 584	5 112 919	26.2	28.3	31.4	35.9	42.4	52.7	70.4	27.9	30.5	34.4	40.0	48.9	63.2	85.8
BY	10 000	30 000	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.3	0.4	0.5
HR	n/a	464 045	1.1	1.2	1.3	1.5	1.8	2.2	2.9	1.1	1.3	1.4	1.7	2.0	2.6	3.6
CZ	1 354 800	1 354 800	3.0	3.3	3.6	4.1	4.8	5.9	7.7	3.2	3.5	3.9	4.5	5.4	6.8	9.2
CY	n/a	33 540 000	31.9	31.8	37.2	43.1	50.6	62.6	84.4	32.9	34.3	39.7	45.3	53.6	67.2	92.0
DK	n/a	14 882 600	8.7	9.4	10.3	11.7	13.6	16.7	21.6	9.0	9.7	10.8	12.4	14.6	18.2	24.2
GR	1 000 000	n/a	1.3	1.4	1.5	1.7	2.0	2.4	3.1	1.3	1.4	1.6	1.8	2.1	2.7	3.5
ES	n/a	70 000 000	65.6	70.5	77.2	86.4	99.7	119.7	152.4	68.5	74.2	82.3	93.5	110.2	136.1	178.5
NL	n/a	5 600 000	3.2	3.5	3.8	4.3	5.0	6.0	7.8	3.3	3.6	4.0	4.5	5.3	6.6	8.7
IS	n/a	11 984 500	7.2	7.2	8.4	9.6	11.1	13.5	17.5	7.4	7.5	8.8	10.0	11.6	14.3	18.7
MT	n/a	2 500 000	2.9	2.8	3.3	3.9	4.6	5.7	7.7	3.0	3.2	3.5	4.1	4.9	6.1	8.4
DE	n/a	7 500 000	5.2	5.6	6.1	6.9	8.1	9.8	12.7	5.4	5.8	6.5	7.4	8.8	10.9	14.4
CH	n/a	50 000 000	15.4	16.5	18.1	20.3	23.4	28.2	36.0	15.9	16.8	19.0	21.4	25.1	30.9	40.5
SE	n/a	34 490 300	19.4	20.5	23.0	25.8	29.9	36.3	46.8	20.0	21.6	23.9	27.1	31.8	39.2	51.8
HU	n/a	5 327 620	16.6	18.0	20.0	22.8	27.0	33.6	44.3	17.6	19.3	21.9	25.6	31.4	40.6	54.6

Source: Author's own calculations

The results demonstrate that the safety in countries such as Croatia, Czech Republic, Greece, Malta and Belarus, and the case of damages from one accident in the national legislation is lower than in the case of countries which have an established level of minimum amounts of coverage according to no. 5 of the Directive of Communication (in Croatia, the transitional period applies between the age and the minimum amounts of coverage arising from the Directive). For example, in Croatia, a minimum amount of coverage is sufficient only in 1.3 pensions for a 20-year-old female, whereas minimum amounts of coverage in accordance with EU directives would be sufficient for 14 such annuities.

In countries such as Cyprus, Spain, Switzerland, and Sweden the situation is reversed. The minimum amount of coverage in accordance with the national law is higher than that resulting from the Directive, and it is sufficient to cover a larger number of annuities. For example, the Spanish national rules allow 70.5 annuities for a 10-year-old female, while EU rules allow only 5. In countries such as Belgium, Finland, France, Ireland, Luxembourg, Norway, and the United Kingdom the minimum amounts of coverage (unlimited coverage) are not specified, resulting in a high sense of security for both the perpetrators and victims of accidents.

Large disparities in the amount of the minimum amounts of coverage indicate the significance one more problem – damage involving foreigners. However, such an analysis is not the subject of this article⁶.

6. the problem for the countries of Central Europe was analyzed in Jędrzychowska A. Poprawska E., Disability Benefits for Victims of Traffic Accidents – Size of Compensations Offered by the Current Amount of Coverage in MTPL Insurance. In: European Financial Systems 2014. Proceedings of the 11th International Scientific Conference, Brno: Masaryk University, 2014, pp. 280–287. ISBN 978-80-210-7153-7, available at: <http://is.muni.cz/do/econ/sborniky/2014/proceedings-EFS-2014.pdf>

The analysis of this issue should also take into consideration the second area of insurance which has been illustrated in this article, namely the third party MLI. Unfortunately, in the case of minimum amounts of coverage at the current level in Poland make it impossible to specify the number of annuities that are covered by these minimum amounts of coverage. For newly born girls in Poland, the present value of such annuity is 391 000 euro, while for a boy it is 364 000 euro.

If these values refer to the amount of minimum amounts of coverage, one can see that their level is insufficient to cover even one such commitment. Similarly, if we take the age of the victim at the level of 40 years, the amount of claims (woman – 247 000 euro, man – 211 000 euro) cannot be covered by the existing liability insurance amount of coverage. Only when the age of the victim is 70 and more, insurance can cover almost all liability towards the victim. For women aged 70 in Poland the present value of annuity is 109 000 euro, while for a man it is 88 000 euro.

3.2 The maximum amount of annuity payment for which the minimum amount of coverage is sufficient

The analysis of the minimum amounts of coverage for compulsory liability insurance can be looked at from another side as well. Namely, by knowing the amount of the minimum amounts of coverage, we can check what amount of payment an injured person can receive if we assume that it is to be covered by the minimum amount of coverage.

Both of these problems will be discussed for the motor third party liability insurance and third party liability insurance associated with medical activity.

Table 3 presents the value of the first benefits available for people of a particular age and from countries with a minimum amount of coverage in MTPL insurance. As seen in the case of the sum of 1 million, in some countries benefits are too low for a victim of any age to receive an annuity. In Table 3, the grey section highlights a situation where the value of the received annuity payment is above the level of the average wage in the economy.

As can be seen in the countries of Central and Eastern Europe (e.g. Belarus, Bulgaria, Czech Republic, Lithuania and Poland) the situation of the victim looks optimistic. However, in countries with high levels of income earned by citizens protection afforded by liability insurance seems considerably worse. And so, for example, in Denmark only citizens over 50 years old will receive an annuity above the amount of the average wage in the economy; a similar situation will take place in Ireland and Spain. The lowest proportion occurs in Norway and Switzerland. For this reason, raising the minimum amount of coverage above the level of the existing according to The 5 Directive by the authorities of those countries should be considered a positive decision. The countries which have done so are: Austria, Belgium, Denmark, Finland, France, Spain, the Netherlands, Ireland, Iceland, Luxembourg, Germany, Norway, Switzerland, Sweden, United Kingdom, and Italy.

Table 3. The amount of the first annual payment that may be paid with a minimum amount of coverage of 1 million

Country code	First annuity payment	females							males						
		age													
		0	10	20	30	40	50	60	0	10	20	30	40	50	60
AT	27 843	19 116	20 580	22 620	25 440	29 520	35 784	46 116	19 884	21 612	23 988	27 276	32 232	40 044	52 968
BE	26 794	19 188	20 676	22 752	25 608	29 760	36 084	46 284	20 004	21 720	24 156	27 504	32 532	40 476	53 556
BY	4 236	19 980	21 720	24 168	27 576	32 544	40 332	53 628	22 140	24 648	28 296	33 492	41 196	53 400	73 632
BG	3 899	19 956	21 576	23 964	27 348	32 340	40 200	53 676	21 252	23 220	26 220	30 540	37 272	48 168	65 448
HR	8 535	19 812	21 528	23 916	27 276	32 292	40 248	54 096	21 120	23 184	26 172	30 372	37 020	47 640	65 532
CZ	8 711	19 428	21 024	23 232	26 292	30 816	37 848	49 740	20 436	22 344	25 020	28 788	34 524	43 812	59 304
CY	20 434	19 416	19 344	22 668	26 244	30 816	38 124	51 396	20 052	20 868	24 204	27 600	32 652	40 932	56 028
DK	33 020	19 296	20 820	22 968	25 932	30 276	36 984	47 880	19 908	21 624	24 048	27 432	32 508	40 488	53 616
EE	9 991	19 476	21 048	23 184	26 040	30 204	36 780	48 096	21 216	23 388	26 484	30 660	36 792	46 728	63 432
FI	29 755	19 104	20 580	22 620	25 380	29 412	35 580	45 684	20 016	21 804	24 276	27 624	32 628	40 428	53 412
FR	26 687	18 948	20 376	22 344	25 020	28 860	34 560	43 656	19 956	21 672	24 096	27 384	32 280	39 756	51 444
GR	15 145	19 116	20 580	22 620	25 440	29 520	35 784	46 116	19 884	21 612	23 988	27 276	32 232	40 044	52 968
ES	20 150	19 188	20 676	22 752	25 608	29 760	36 084	46 284	20 004	21 720	24 156	27 504	32 532	40 476	53 556
NL	33 525	19 980	21 720	24 168	27 576	32 544	40 332	53 628	22 140	24 648	28 296	33 492	41 196	53 400	73 632
IE	27 413	19 956	21 576	23 964	27 348	32 340	40 200	53 676	21 252	23 220	26 220	30 540	37 272	48 168	65 448
IS	31 619	19 812	21 528	23 916	27 276	32 292	40 248	54 096	21 120	23 184	26 172	30 372	37 020	47 640	65 532
LX	38 254	19 428	21 024	23 232	26 292	30 816	37 848	49 740	20 436	22 344	25 020	28 788	34 524	43 812	59 304
LV	5 955	19 416	19 344	22 668	26 244	30 816	38 124	51 396	20 052	20 868	24 204	27 600	32 652	40 932	56 028
LT	6 487	19 296	20 820	22 968	25 932	30 276	36 984	47 880	19 908	21 624	24 048	27 432	32 508	40 488	53 616
MK	4 152	19 476	21 048	23 184	26 040	30 204	36 780	48 096	21 216	23 388	26 484	30 660	36 792	46 728	63 432
MT	16 872	19 104	20 580	22 620	25 380	29 412	35 580	45 684	20 016	21 804	24 276	27 624	32 628	40 428	53 412
DE	27 782	18 948	20 376	22 344	25 020	28 860	34 560	43 656	19 956	21 672	24 096	27 384	32 280	39 756	51 444
NO	46 205	19 116	20 580	22 620	25 440	29 520	35 784	46 116	19 884	21 612	23 988	27 276	32 232	40 044	52 968
PL	7 614	19 188	20 676	22 752	25 608	29 760	36 084	46 284	20 004	21 720	24 156	27 504	32 532	40 476	53 556
PT	12 683	19 980	21 720	24 168	27 576	32 544	40 332	53 628	22 140	24 648	28 296	33 492	41 196	53 400	73 632
RO	4 147	19 812	21 528	23 916	27 276	32 292	40 248	54 096	21 120	23 184	26 172	30 372	37 020	47 640	65 532
SK	7 977	19 428	21 024	23 232	26 292	30 816	37 848	49 740	20 436	22 344	25 020	28 788	34 524	43 812	59 304
SI	11 926	19 416	19 344	22 668	26 244	30 816	38 124	51 396	20 052	20 868	24 204	27 600	32 652	40 932	56 028
CH	61 571	19 296	20 820	22 968	25 932	30 276	36 984	47 880	19 908	21 624	24 048	27 432	32 508	40 488	53 616
SE	33 907	19 476	21 048	23 184	26 040	30 204	36 780	48 096	21 216	23 388	26 484	30 660	36 792	46 728	63 432
UA	1 968	19 104	20 580	22 620	25 380	29 412	35 580	45 684	20 016	21 804	24 276	27 624	32 628	40 428	53 412
GB	33 723	18 948	20 376	22 344	25 020	28 860	34 560	43 656	19 956	21 672	24 096	27 384	32 280	39 756	51 444
HU	6 385	19 116	20 580	22 620	25 440	29 520	35 784	46 116	19 884	21 612	23 988	27 276	32 232	40 044	52 968
I	20 834	19 188	20 676	22 752	25 608	29 760	36 084	46 284	20 004	21 720	24 156	27 504	32 532	40 476	53 556

Source: Author's own calculations

However, if one looks at the use of a higher minimum amount of coverage, the situation looks much better, because in this case in all countries the victims can receive benefits at the level of the average net wage in the economy. Note, however, that there can be more than one victim, and the earnings of each of them may exceed the average wage in the economy.

Due to the fact that the MLI is not regulated at the EU level, the analysis will focus on Poland and those countries whose citizens frequently visit Poland. The minimum amount of insurance coverage for doctors and clinics is insufficient to pay an annuity to the victim at an acceptable level. Starting with an analysis of the data for Poland, it should be noted that the liability insurance for doctors may be paid as an annuity for a newborn baby, where the first payment will amount to EUR 121.70 per month for a girl and EUR 130.60 for a boy. If these amounts relate to the average wage in the economy, they constitute respectively 19.3% and 20.1%.

This shows how low is the security for personal injury claims arising e.g. during childbirth. A similar analysis for MLI indicates that the pension for girls that can be paid monthly is on the level of EUR 162.26 and EUR 174.13 for boys. These amounts also oscillate at about 20% of the average net salary in the Polish economy. It is also worth pointing out what age of the victim will allow for the payment of benefits at the level of the average net wage in the economy. Currently, in Poland it is the age of 78 for women and 74 for men.

If the analysis is extended to other countries, the highest value of the annuity will be for the citizens of Ukraine and Belarus (for girls it is EUR 124.88 and EUR 128.24 per month, and for boys it is EUR 138.41 EUR 142.23 per month, respectively), which, relating to the average wages in the economy, gives security to the citizens of Ukraine at the level of approx. 78% and 20,7% for Belarus. The lowest annuities from the insurance can be paid to victims from Germany (per month: women – 119.99 EUR, men – 124.45 EUR). The ratio of the average wage in the German economy is approx. 3,1%.

Similar conclusions can be reached by analysing insurance for MLI. Specific details for both insurance types are in Tables 4 and 5. Just like previously, the grey fields indicate when the value of annuity obtained from the minimum amount of coverage is above the level of the average wage in the economy.

Table 4. The amount of the first annual payment that may be paid with a minimum amount of coverage of EUR 75,000.

Country code	First annuity payment	Females								Males					
		age													
		0	10	20	30	40	50	60	0	10	20	30	40	50	60
BY	4 236	1500	1632	1812	2064	2436	3024	4020	1656	1848	2124	2508	3084	4008	5520
CZ	8 711	1452	1572	1740	1968	2316	2844	3732	1536	1680	1872	2160	2592	3288	4452
LV	5 955	1476	1596	1776	2016	2364	2892	3756	1632	1812	2064	2424	2940	3744	4992
DE	27 782	1440	1548	1704	1920	2244	2724	3516	1488	1620	1800	2052	2436	3024	4008
PL	7 614	1464	1572	1740	1968	2304	2832	3672	1572	1716	1932	2244	2700	3420	4560
SK	7 977	1476	1596	1764	2004	2352	2904	3840	1572	1716	1932	2244	2712	3468	4716
UA	1 968	1536	1668	1872	2148	2544	3180	4272	1704	1896	2184	2604	3180	4104	5580
GB	33 723	1440	1560	1716	1932	2244	2724	3504	1488	1608	1788	2028	2388	2952	3888

Source: Author's own calculations

Table 5. The amount of the first annual payment that may be paid with a minimum amount of coverage of EUR 100,000.

Country code	First annuity payment	Females						Males							
		age													
		0	10	20	30	40	50	60	0	10	20	30	40	50	60
BY	4 236	1998	2172	2416	2758	3255	4033	5362	2215	2464	2830	3350	4119	5340	7363
CZ	8 711	1943	2103	2323	2630	3082	3785	4974	2043	2234	2501	2878	3452	4381	5931
LV	5 955	1971	2136	2367	2691	3155	3858	5013	2180	2415	2756	3227	3912	4991	6664
DE	27 782	1919	2069	2277	2566	2986	3631	4695	1991	2163	2404	2740	3244	4040	5343
PL	7 614	1947	2103	2322	2629	3079	3770	4890	2090	2290	2579	2984	3603	4566	6076
SK	7 977	1964	2122	2349	2667	3139	3874	5115	2092	2288	2577	2985	3620	4630	6288
UA	1 968	1907	2014	2258	2538	2943	3567	4602	1962	2126	2353	2661	3123	3853	5094
GB	33 723	2052	2227	2492	2862	3394	4236	5697	2276	2526	2919	3468	4246	5466	7446

Source: Author's own calculations

3.3 Number of annuity payments (years) for which the minimum amount of coverage is sufficient

Another discussed issue pertains to the question of the number of years for which the minimum amount of coverage is sufficient. The issue will be analysed for victims of different ages, of both sexes and various nationalities, assuming that annuity payments will be equal to the average net salary in the economy.

As previously done, the discussion regarding MLI will be limited to the countries geographically close to Poland. The minimum amount of coverage for the insurance of doctors (EUR 75,000) and for MLI (EUR 100,000) will give the same results, which are presented in Table 6.

Table 6. Number of years for which an annuity may be paid at the level of the average net wage in the economy with minimum amounts of coverage at EUR 75,000 and EUR 100,000

Country code	Females					Males				
	age									
	0	20	40	60	80	0	20	40	60	80
AT	2	2	2	2	2	2	2	2	2	2
BE	2	2	2	2	3	2	2	2	2	3
BY	20	20	20	27	s	20	20	22	s	s
CZ	9	9	9	9	s	9	9	9	10	s
FR	2	2	2	2	2	2	2	2	2	3
ES	3	3	3	3	4	3	3	3	3	4
NL	2	2	2	2	2	2	2	2	2	2
IE	2	2	2	2	2	2	2	2	2	3
LV	13	13	14	14	s	13	13	14	19	s
LT	12	12	12	13	s	12	12	13	16	s
DE	2	2	2	2	2	2	2	2	2	2
NO	1	1	1	1	1	1	1	1	1	1
PL	10	10	10	11	s	10	10	10	12	s
SK	10	10	10	10	s	10	10	10	11	s
CH	1	1	1	1	1	1	1	1	1	1
SE	2	2	2	2	2	2	2	2	2	2
UA	53	58	s	s	s	55	s	s	s	s
GB	2	2	2	2	2	2	2	2	2	2
I	3	3	3	3	3	3	3	3	3	4

s – sufficient for a lifetime

Source: Author's own calculations

Since this value is heavily determined by two factors: life expectancy in the country and the amount of the average salary in the economy, it could be intuitively determined that the countries of Western Europe would receive a smaller minimum amount of coverage, and the citizens of central and Eastern Europe would definitely receive higher payments of the annuities. Generally, however, these sums are not, except in the case of pension for citizens of Ukraine, sufficiently high to protect the victims (for a newborn boy the annuity may be paid for up to 55 years).

However, it is worth to concentrate on the example of Poland, because annuities from this country's insurance will be paid mostly to Polish citizens. It is worrying that the calculations indicate that the insurance will cover only 10 years of annuity payments.

A similar study related to the MTPL insurance provides decidedly better results. Even the lower amounts provide full protection for citizen from countries such as Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Greece, Lithuania, Latvia, Macedonia, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Ukraine, and Hungary.

Here, also, the lowest protection applies to the citizens of Western Europe and Scandinavia. It must be remembered that in these countries the minimum amount of coverage is higher. Detailed results are presented in Table 7. It should be noted that the higher minimum amount of coverage (EUR 5 million) fully covers the annuity in each country.

Table 7. Number of years for which an annuity may be paid at the level of the average net wage in the economy with minimum amounts of coverage at EUR 5 mln

Country code	Females					Males				
	age									
	0	20	40	60	80	0	20	40	60	80
AT	47	48	s	s	s	48	49	s	s	s
BE	50	51	s	s	s	50	53	s	s	s
CY	76	s	s	s	s	80	s	s	s	s
DK	38	38	42	s	s	38	38	49	s	s
FI	43	44	52	s	s	43	45	s	s	s
FR	50	51	s	s	s	51	54	s	s	s
ES	78	s	s	s	s	83	s	s	s	s
NL	37	37	40	s	s	37	37	43	s	s
IE	48	49	s*	s	s	49	51	s	s	s
IS	40	38	44	s	s	40	41	48	s	s
LX	31	30	33	s	s	31	32	34	s	s
DE	47	48	s	s	s	48	50	s	s	s
NO	25	25	25	43	s	25	25	26	s	s
CH	18	18	18	19	s	18	18	18	21	s
SE	36	37	39	s	s	37	37	41	s	s
GB	37	37	40	s	s	37	37	43	s	s
I	73	s	s	s	s	76	s	s	s	s
BY, BG, HR, CZ, EE, GR, LV, LT, MK, MT, PL, PT, RO, SK, SI, UA, HU	s	s	s	s	s	s	s	s	s	s

s – sufficient for a lifetime

Source: Authors's own calculations

3.4 Case studies

To illustrate the problem of the depletion of the minimum amount of coverage, it is also worth to analyse two short case studies which may relate to typical traffic accidents (case 1) or medical malpractice (case 2).

Case 1

Description: Two people are travelling by car: a 35-year-old woman and 42-year-old man. As a result of an accident, the woman dies and the man becomes permanently unable to work.

Therefore, claims have been raised by:

- the dead woman's two children (3 years old, 7 years old),
- the widower (39 years old),
- the 42-year-old man injured in the accident, because he is not able to undertake professional activity.

The woman's earnings before the accident were at the level of the average wage in the economy. The earnings of the man who survived the accident were at the level of two average wages in the economy. In the case of pensions for indirect victims, net salary is reduced by the own consumption of the deceased (we assume 30%). The remaining part is divided between the remaining persons, usually the spouse receives 50%, while the rest is divided between the children in equal proportions, in this case 25%).

Children shall receive the annuity till they are 18 years old or until the completion of their education, but not longer than until 25 years of age (in practice, there usually dominates the second option). The widower shall receive the annuity until the younger of the children becomes 18 years old. The man who is the victim of the accident shall receive an annuity for the rest of his life. The results of the calculations are presented in Table 8.

It is worth paying attention to such countries as Switzerland, where the sum of the present values of annuities is close to EUR 5 million. Therefore, it makes sense to define the country's minimum amount of coverage at the level 10-times higher. Moreover, in 14 countries the sum of present values of the annuities, which may be the consequence of such an accident, exceeds EUR 2 million, and in another 5 countries it exceeds EUR 1 million.

Case 2

Description: as a result of medical malpractice, a 35-year-old man dies. Three people are indirectly affected – his 30-year-old wife and two children aged 4 and 7. The victim's earnings were at the average salary level. The share of his personal consumption was set at 30% of net salary. Therefore, 70% of the average wage is the basic amount for the calculation of pensions for the indirectly injured. Children will receive a pension till the age of 25, assuming they continue education (21 and 18 years of compensation), amounting to 25% of the basic amount, and the widow has the right to an annuity for the children (14 years of compensation), amounting to 50% of the basic amount.

Annual payment in this case is adequate to the size of the average annual net salary in each of the analysed countries (according to Eurostat and national sources for non-EU countries). Data is presented in Table 9.

Table 8. Present values for increasing annuities

Country code	Present values of annuity for individuals						Total present value for annuities (4 variants of the gender of children)			
	42-year-old victim	39-year-old widower	3-year-old girl	7-year-old girl	3-year-old boy	7-year-old boy	2 girls	3-year-old girl 7-year-old boy	7-year-old girl 3-year-old boy	2 boys
AT	1 661 814	138 587	186 466	175 759	185 334	174 593	2 162 626	2 161 460	2 161 495	2 160 328
BE	1 584 171	133 124	179 271	168 976	178 195	167 858	2 065 542	2 064 424	2 064 466	2 063 348
BY	196 232	20 147	28 157	26 530	27 447	25 791	271 066	270 327	270 356	269 617
BG	199 734	19 078	25 984	24 497	25 702	24 205	269 294	269 002	269 011	268 719
HR	440 355	41 777	56 991	53 716	56 231	52 942	592 839	592 065	592 079	591 305
CZ	1 202 479	101 823	144 101	132 756	135 921	135 152	1 581 159	1 583 555	1 572 979	1 575 375
CY	483 422	43 105	58 275	54 928	57 842	54 472	639 729	639 274	639 296	638 840
DK	1 953 657	164 236	221 230	208 505	220 222	207 497	2 547 627	2 546 619	2 546 619	2 545 612
EE	520 231	48 584	69 879	62 499	65 291	61 391	701 194	700 086	696 605	695 497
FI	1 755 382	147 449	198 942	187 507	197 469	185 939	2 289 281	2 287 713	2 287 807	2 286 240
FR	1 592 030	132 088	178 538	168 272	177 169	166 858	2 070 928	2 069 515	2 069 560	2 068 146
GR	899 505	75 176	101 388	95 582	100 600	94 756	1 171 651	1 170 825	1 170 864	1 170 038
ES	1 222 400	100 327	135 043	127 297	134 482	126 722	1 585 067	1 584 492	1 584 505	1 583 931
NL	2 035 126	167 340	224 486	211 600	223 783	210 908	2 638 552	2 637 860	2 637 849	2 637 157
IE	1 660 210	136 427	183 418	172 856	182 200	171 613	2 152 911	2 151 668	2 151 693	2 150 450
IS	1 987 435	157 884	217 333	205 293	216 228	198 537	2 567 945	2 561 189	2 566 840	2 560 084
LV	290 890	28 517	39 652	37 361	38 630	36 297	396 419	395 355	395 398	394 334
LX	2 322 707	190 910	269 306	254 587	261 918	240 588	3 037 510	3 023 511	3 030 122	3 016 123
LT	318 332	31 190	44 336	40 728	42 372	39 846	434 586	433 704	432 622	431 740
MK	217 784	20 478	27 719	26 131	27 530	25 934	292 112	291 915	291 923	291 726
MT	984 206	83 952	118 783	112 371	115 478	121 020	1 299 312	1 307 961	1 296 006	1 304 655
DE	1 646 503	138 235	186 073	175 399	185 182	174 480	2 146 209	2 145 290	2 145 318	2 144 399
NO	2 827 551	230 539	309 457	291 670	307 947	298 158	3 659 218	3 665 705	3 657 708	3 664 195
PL	404 704	37 221	50 907	47 980	50 209	47 258	540 812	540 091	540 114	539 393
PT	741 289	62 668	84 871	79 999	84 275	79 368	968 827	968 196	968 232	967 601
RO	213 359	20 231	27 642	26 054	27 292	25 692	287 287	286 925	286 937	286 575
SK	421 289	39 148	53 324	50 272	52 738	49 645	564 033	563 407	563 446	562 820
SI	688 078	59 228	79 892	81 593	79 381	74 798	908 790	901 995	908 280	901 485
CH	3 836 959	307 500	412 699	389 011	411 121	387 361	4 946 168	4 944 519	4 944 591	4 942 941
SE	2 091 930	169 388	227 099	214 043	226 129	213 063	2 702 460	2 701 480	2 701 489	2 700 510
UA	88 572	9 228	13 009	12 253	12 601	11 830	123 062	122 639	122 654	122 231
HU	323 880	31 218	42 649	40 198	42 269	39 790	437 945	437 537	437 565	437 157
GB	2 039 644	167 607	225 592	212 625	224 462	211 451	2 645 468	2 644 294	2 644 338	2 643 165
I	1 282 072	103 967	139 615	131 612	138 996	130 968	1 657 266	1 656 622	1 656 647	1 656 003

Source: Author's own calculations

Table 9. Present values for increasing annuities – case 2

Contry code	First payment for individuals			Total present value for annuities (4 variants of the gender of children)			
	wife	child 1	child 2	2 boys	4-year-old boy 7- year-old girl	7-year-old boy 4- year-old girl	2 girls
BY	1 482.60	741.30	741.30	46 562.58	46 586.60	46 588.16	46 612.18
CZ	3 048.85	1 524.42	1 524.42	96 058.38	96 081.10	96 079.86	96 102.58
LV	2 084.18	1 042.09	1 042.09	65 483.34	65 526.12	65 528.20	65 570.97
DE	9 723.85	4 861.92	4 861.92	306 514.04	306 573.49	306 579.33	306 638.78
PL	2 664.85	1 332.43	1 332.43	83 918.07	83 951.33	83 953.22	83 986.48
SK	2 792.02	1 396.01	1 396.01	87 915.79	87 956.95	87 955.56	87 996.71
UA	688.80	344.40	344.40	21 574.23	21 587.73	21 588.98	21 602.48
GB	11 803.11	5 901.55	5 901.55	371 872.07	371 937.76	371 940.05	372 005.74

Source: Author's own calculations

Table 10. Present values for constant annuities⁷ – case 2

Contry code	First payment for individuals			Total present value for annuities (4 variants of the gender of children)			
	wife	child 1	child 2	2 boys	4-year-old boy 7- year-old girl	7-year-old boy 4- year-old girl	2 girls
BY	1 482.60	741.30	741.30	41 112.50	41 131.51	41 131.94	41 150.95
CZ	3 048.85	1 524.42	1 524.42	84 799.51	84 817.19	84 815.34	84 833.01
LV	2 084.18	1 042.09	1 042.09	57 819.65	57 853.07	57 853.27	57 886.69
DE	9 723.85	4 861.92	4 861.92	270 577.27	270 624.09	270 626.76	270 673.58
PL	2 664.85	1 332.43	1 332.43	74 086.17	74 112.17	74 112.52	74 138.52
SK	2 792.02	1 396.01	1 396.01	77 615.62	77 648.47	77 645.67	77 678.52
UA	688.80	344.40	344.40	19 051.27	19 061.89	19 062.43	19 073.05
GB	11 803.11	5 901.55	5 901.55	328 278.64	328 330.21	328 329.66	328 381.23

Source: own calculations

In this case, the family of the injured person receives a benefit lower than the average wage in the economy and receives it not for life, but for a limited time. Coverage of this payment is definitely better - although it still does not cover all the claims.

In this case it is possible to see a difference in the level of benefits which are paid to people from different countries. It is important to remember that the compensation should be set at a level corresponding to the victim's previous standard of living. However, the minimum amount of cover is often not high enough to cover the claims, especially for the citizens of Great Britain and Germany.

In all the cases the highest volume of the present value of annuities were obtained for Great Britain, Lithuania, Slovakia, Poland and Czech Republic. The lowest values were calculated for the annuities for Belarus, Russia and Ukraine. The last case takes into account the realities of individual

7. The authors postulate that it is necessary to increase the annuities. However, the Polish courts seldom rule an increase, and benefits are constant through all the years. This is to illustrate the exhaustion of a minimum guaranteed sum even if the benefit is not indexed.

countries. These results therefore show how important it is to meet the realities of the economic and demographic environment (country) of the victim's origin in the calculation of the damages claim.

Summary

The article was devoted to analysing the coverage of claims relating to personal injuries by the minimum amount of coverage for two types of liability insurance, i.e. MTPL insurance due to a substantial share of the insurance market of non-life insurance, and MLI.

In the first part, we outline the importance of the problem of personal injuries regarding those insurance, and we identify a number of proposals related to the possible evaluation of these claims in the case of the suffered loss of income. It should be noted, however, that the authors believe it is worrying that in the Polish system does not have an objective method of calculating such claims (as is the case, for example, in the UK - The Ogden Tables - Actuarial Tables with explanatory notes for use in Personal Injury and Fatal Accident Cases) or partially valid in the United States' 9/11 Victim Compensation Fund -VCF⁸.

Ensuring the safety of victims should be associated with a clear path of investigation of their claims for compensation. The existing conditions, associated with uncertainty about the value of the incurred damage, which results in the bitterness of victims, as well as the process of pursuing their claims is associated with the "fight for their rights". It is worth noting that the implementation of a coherent system for evaluation of measurable elements of compensation (such as lost income) would be valuable for the institutions responsible for paying such claims – i.e. insurance companies and the Insurance Guarantee Fund.

The part of the article pertaining to the calculations is concerned with the verification of the degree of coverage of the benefits for annuities by minimum amounts of coverage for the chosen two types of compulsory third party liability insurance in Poland. The MTPL insurance is regulated at international level, and thus the level of minimum amount of coverage is applied to the realities of the countries involved in the Green Card System or the Multilateral Agreement.

There are advantages for the victims, because the amounts resulting from the security offered by this insurance, in many cases (especially after raising them in certain EU countries) cover up to several annuity claims on the net minimum wage level in the economy. For the sake of good practice, it should be considered to constantly verify these amounts and raise their minimum level accordingly.

For example, the Expert Group on European Insurance Contract Law (Expert Group, 2013) postulate to raise minimum amounts of cover by the average inflation rate. In 2013, this group proposed the following amounts:

- in the case of personal injury, a minimum amount of cover of EUR 1,120,000 per victim or EUR 5,600,000 per claim, regardless of the number of victims;
- in the case of damage to property, EUR 1,120,000 per claim, regardless of the number of victims.⁹

8. F. Tinari, K.E. Cahill, E. Grivoyannis, Did the 9/11 Victim Compensation Fund Accurately Assess Economic Losses?, "Topics in Economic Analysis & Policy", vol. 6, Issue 1 (January 2006), p. 1–42; <http://www.tinari-economics.com/sites/default/files/Victim%20Compensation%20Fund.pdf>.

9. See for the revised amounts: *Commission notice regarding the adaptation in line with inflation of certain amounts laid down in the Motor Insurance Directive 2009/103/EC (2010/C 332/01)*, <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:332:0001:0001:EN:PDF>

Simulations and case studies dedicated to insurance liability associated with medical activity show that Poland does not provide security either for the perpetrator or for the victim. This level represents no security of claims at the level of the average net wage for injured persons under the age of 70; the minimum amount of coverage allows to pay the national average wage only for the victims of age 70 and more. It should be emphasized that the insurance with such a low amount of coverage is also dedicated to doctors who take care of children, and this results in a long time horizon of possible annuities. The amount of guarantee amounts given by the legislator are of course the lowest values of MLI. It is therefore appropriate for doctors and hospitals to take into account their exposure to the risk of personal injury and to buy liability insurance with a higher guaranteed sum. However, the authors consider the current situation as imperfect and believe that insurance awareness of Poles is an important issue.

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Wystarczalność minimalnych sum gwarancyjnych do pokrycia szkód osobowych – w oparciu o ubezpieczenie odpowiedzialności cywilnej posiadaczy pojazdów mechanicznych i ubezpieczeń odpowiedzialności cywilnej związanych z działalnością medyczną

Głównym zadaniem ubezpieczenia od odpowiedzialności cywilnej jest ochrona ubezpieczonego przed skutkami finansowymi ewentualnych roszczeń, które mogą być konsekwencją zdarzeń, za które odpowiedzialny jest posiadacz ubezpieczenia i z tego powodu jest zobowiązany. Z drugiej strony ubezpieczenie tego rodzaju chroni również osoby trzecie – poszkodowanych. Należy jednak pamiętać, że odpowiedzialność ubezpieczyciela jest ograniczona przez wysokością sumy gwarancyjnej określonej w umowie.

Celem artykułu jest zbadanie, w jakiej mierze minimalne sumy gwarancyjne dwóch typów obowiązkowych ubezpieczeń OC są wystarczające do pokrycia ewentualnych roszczeń. Autorzy skupią się na szkodach osobowych, których głównym elementem pokrycia są świadczenia rentowe i właśnie w takich przypadkach wypłacane są najwyższe świadczenia.

Analiza będzie oparta na wynikach przeprowadzonych symulacji rent według płci i wieku ofiary w wybranych krajach europejskich. Wyniki symulacji będą odniesione do minimalnych sum gwarancyjnych w ubezpieczeniu od odpowiedzialności cywilnej posiadaczy pojazdów mechanicznych i ubezpieczenia odpowiedzialności cywilnej związanej z działalnością medyczną.

Słowa kluczowe: minimalna suma gwarancyjna, ubezpieczenie odpowiedzialności cywilnej, renta, szkody osobowe

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