Master in Actuarial and Financial Sciences

# MASTER THESIS

**Title: THE COST OF SEVERE DEPENDENCE ATTRIBUTABLE TO RTIs IN SPAIN ACCORDING TO EDAD 2020. A MACRO AND ACTUARIAL PERSPECTIVE**

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**Academic year: 2023-2024**

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Master thesis

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# Abstract

Road traffic injuries are one of the leading causes of disease burden, and their incidence has continued to increase in recent years. We analyze long-term care needs associated with disability attributable to road traffic accidents in Spain and conclude they entail a significant burden for families and society, given the support these victims need is life-long. Furthermore, the high socio-economic costs of road traffic accidents (in Spain 0.08% of the GDP in 2020) in addition to the victims' lifetime economic losses (over €100,000 per victim (ages 18-40)) clearly indicate the need for governments and policymakers to strengthen road accident preventive measures.



**Key Words:** Traffic accidents, Long term care, Social care, Disability, Actuarial cost.

# INDEX

## 1. Introduction

Many studies associate road accidents with permanent injuries. According to the World Health Organization (WHO), between 20 and 50 million people suffer non-fatal injuries every year as a result of road traffic accidents, many of whom are left disabled as a result of their injuries (WHO, 2022). However, there is a lack of a globally accepted scale for evaluation of the long-term outcomes of crash injuries (Babaie et al., 2023). The incidence of RTIs has significantly increased in the last 30 years (Wan et al., 2023). Moreover, RTIs are projected to be the fourth leading cause of disease burden (Alam & Mahal, 2016; Mathers & Loncar, 2006) and one of the main causes of disability-adjusted life expectancy in 2030 (Peden & World Health Organization, 2004; Zimmerman et al., 2012). RTIs cause individual consequences (such as physical and mental), but also have an impact on the person's family and affect them socially and financially (Azami-Aghdash, 2020). Therefore, they have a variety of impacts on a person's life, such as, early retirement, long-term sick leave, job change (motivated by the injuries sustained), and in general, reduced welfare and quality of life (Björnstig & Larsson, 1994; Haukeland, 1996). According to datasets assembled from the National Health Interview Survey (NHIS) and other sources, motor vehicle injuries ranked 9th among the leading causes of DALYs in the US (JAMA, 2013). Despite the appreciable reduction in traffic accident figures observed in Spain from 2000 onwards, the resulting injuries continue generating a substantial disease burden, with a great impact on the country's social and economic spheres (Palmera-Suárez et al., 2015; Tolón-Becerra et al., 2013).

Studies analyzing the relationship between car accidents and subsequent disabilities have considered a range of factors that include the victims' socio-demographic profile, the characteristics of the accident and the injuries suffered by the victims (Hours et al., 2010). Ferrando et al. (1998) examine the incidence of road traffic accident disabilities among the population of Barcelona, as well as its distribution by age, gender and type of motor-vehicle user. Chen et al. (2013) take into account sociodemographic characteristics to show that adults with financial disadvantage bear disproportionately heavier burden of road traffic disability. Other studies examine the effects of age, sex, region and type of vehicle on disability and death rates (Morais Neto et al., 2016; Palmera-Suárez et al., 2015, 2018).

Estimates show that road traffic crashes cost most countries 3% of their gross domestic product (WHO, 2022). Wijnen and Stipdonk (2016) show that the share of fatalities in the total costs of road traffic crashes is higher on low and middle income countries. Studies of the direct and indirect costs of these accidents typically distinguish between those associated with medical, administrative and vehicle repair costs, on the one hand; and early mortality and productivity reduction costs attributable to disabilities, on the other (Banstola et al., 2020; Jaramillo et al., 2016; Kruse, 2015; van der Vlegel et al., 2020; Wan et al., 2023; Weijermars et al., 2018; Xu et al., 2022; Zakeri et al., 2021). However, these studies do not consider the long-term care costs that victims might incur as a result of an accident (see Guillen and Comas-Herrera, 2012 for the analysis of lifetime costs in long-term care). Indeed, despite the personal and societal burden associated with crash-related disabilities, little population-based information is available about their long-term effects (Alghnam et al., 2015; Haider et al., 2020). The younger part of the population is hit by traffic accidents more than the older part, so there is a cumulative effect when the whole life cycle of individuals is considered.

Our objective is to analyze the effects of road traffic accidents on long-term care (LTC) needs in Spain, and, to do so, we draw on information obtained from a survey carried out in 2020 by the Spanish Institute of Statistics. Since 2006, Spain has promoted the provision of personal care for dependents (Law 39/2006, December 14) offering LTC benefits to all citizens who cannot perform basic activities of daily living unaided, i.e., the basic tasks that a person undertakes on a day-to-day basis, including, personal care, domestic duties and mobility. Traffic accidents are one of the reasons why such situations of dependence can arise and, as such, there is a close link between road safety policies and social welfare policies for the disabled. In this paper we estimate: (a) the chronic impairment attributable to RTIs; (b) the prevalence of dependence attributable to RTIs among individuals aged 18 and older; (c) degrees of injury severity associated with the dependence attributable to RTIs, (d) the annual costs of LTC associated with RTIs and the proportion of the country's GDP destined to it, and (e) the actuarial cost of dependence attributable to RTIs for full dependents. We also compare distributions of impairment, age and degree of severity for those presenting disabilities attributable to RTIs and those with disabilities attributable to other causes.

This paper represents a pioneering analysis of the prevalence of dependence among victims of traffic accidents in Spain using the most recent data collected by the Spanish Institute of Statistics in 2020. In this study, however, we have used a less restrictive definition of an individual's limitations (sight, hearing, communication, mobility, etc.) attributable to RTIs, in that we consider an individual to be dependent if any of the disabilities suffered (and included on the assessment scale) can be traced to a traffic accident. According to Shults et al. (2004), estimated prevalence rates could be 20% lower if we consider an RTI disability to have occurred if the individual attributes a limitation in each category to crash-related injuries. However, we did not use this method of calculation here.

## 2. Methods

To carry out this study, we have used the Disability, Personal Autonomy and Situations of Dependence Survey (Encuesta sobre Discapacidad, Autonomía Personal y Situaciones de Dependencia. EDAD, 2020); a national survey conducted by the Spanish National Institute of Statistics to assess information about disabilities, dependence, ageing and the population's health status. Participants are interviewed after having been randomly selected via a multistage sampling process. The questions are answered by adults living in the chosen households or those working at selected institutions with information about the health of the remaining household members or institutionalized individuals. In an initial stage (August 2020 to January 2021), 164,254 people belonging to 67,488 different family households were interviewed (EDAD-home); in a second stage (April 2021 to October 2021), 11,650 people that reported some limitation in the first survey were interviewed. This additional survey (EDAD-disabilities) was included to gather detailed information about people with disabilities.

The EDAD-disabilities survey collected information about health conditions and the functional and sensory limitations associated with disabilities, both from family members in the participating households and from the institutionalized individuals themselves. An impairment was considered chronic (permanent health defect) if the participant had first noticed it more than one year before the interview. The causes of impairment ranged from

disease, congenital malformation, birth defects, traffic accidents, occupational accidents, domestic accidents, leisure-related accidents, diseases related to usual occupation, or other causes.

Functional and sensory limitations were grouped into eight categories: (1) Vision, (2) Audition, (3) Communication, (4) Learning and knowledge application and task development, (5) Mobility, (6) Self-care – ADL (activities of daily living; i.e. bathing or showering, dressing, eating, using the toilet, etc.), (7) Domestic life – IADL (instrumental activities of daily living; i.e. shopping, preparing meals, using the telephone, managing money, etc.) and (8) Interpersonal relationships. Individuals that presented limitations in one or more of the eight categories were asked about their main health problem and, in each case, to identify the principal cause in each category (including traffic accidents).[1]

Our dataset corresponds to the EDAD-disability survey, therefore, we have aligned the 18 questions in section D of the initial survey (EDAD-home) [2] with the most similar ones from our dataset[3] to determine different types of impairments directly related to the eight functional and sensory categories (see above). These 21 disabilities are outlined in Table 1.

[1] Note that our data only provides information on the cause of each category of limitations, rather than the cause of each individual limitation.

[2] Both surveys and the data we used are publicly available on INE's official website.

[3] We have done this association to try to replicate how the different impairments were determined in Alemany et al.'s study (2013), which studied the EDAD2008 survey (note that the questions were not the same in both surveys, which complicated the process).

**Table 1**
Types of disability considered.

| **VISION/AUDITION/ COMMUNICATION/RELATIONSHIPS** | **LEARNING** |
|---|---|
| 1. Is blind. | 11. Has major difficulties paying attention with their eyes or sustaining attention with their ears. |
| 2. Has major difficulties seeing the letter of a newspaper when wearing glasses or contacts. | 12. Has major difficulties learning or performing tasks without help or supervision. |
| 3. Has major difficulties seeing a face at a 4-meter distance when wearing glasses or contact lenses. | **MOBILITY** |
| 4. Has other major visual difficulties when wearing glasses or contact lenses (night vision, colour differentiations, people blind in one eye…). | 13. Has major difficulties keeping the body in the same position for a while or changing positions without help or supervision. |
| 5. Is deaf. | 14. Has major difficulties moving outside of their home without help or supervision. (including using or driving means of transport). |
| 6. Has major difficulties hearing what is being said in a conversation between multiple people without help. | 15. Has major difficulties lifting or carrying an object using hands and arms without help or supervision. |
| 7. Has major difficulties hearing an alarm, siren or any other loud sound without help (or is deaf in one ear). | 16. Has major difficulties manipulating and moving objects using arms, hands and fingers without help or supervision. |
| 8. Has major difficulties speaking their usual language, holding a conversation or understanding the meaning of what other people say. | **SELF CARE** |
| 9. Has major difficulties understanding written texts, expressing themselves through them or understanding gestures, drawings… (excluding those who didn't learn how to read or write but don't have any health issue or impairment) | 17. Has major difficulties cleaning or drying themselves, taking showers or performing other basic body care activities without help or supervision. |
| | 18. Has major difficulties dressing, undressing or feeding themselves, going to the bathroom or taking medicine without help or supervision. |
| | **DOMESTIC LIFE** |
| 10. Has major difficulties using the telephone without help or supervision. | 19. Has major difficulties organizing and buying food, clothes or other house items without help or supervision (older than 12) |
| 21. Has major difficulties relating to other people, starting emotional relationships or starting a family. | 20. Has major difficulties undertaking daily housework activities without help or supervision. (older than 12) |

Source: own elaboration.

In this study, we selected those individuals from the sample who explicitly reported that at least one of the categories of their functional and sensory disabilities was attributable to a traffic accident. Then, our goal was to quantify and assign every individual a grade of dependence according to the limitations they reported. To do this, we used the Spanish

dependence scale,[4] which designates a specific score (according to age and category) when the individual can't perform certain activities. It's important to note that the questions on the survey do not align with the 10 dependence scale categories and their subcategories, therefore we had to individually study and choose the survey questions that were the most accurate. The 10 categories considered are: i) Eating and drinking, ii) Personal hygiene related to urination and defecation, iii) Washing up, iv) Performing other body care,[5] v) Dressing, vi) Health maintenance, vii) Changing and maintaining body position, viii) Moving within the home, ix) Moving outside the home, and x) Performing household tasks. In some categories, we have found more than one question related to it -given that every category has subcategories- and in other cases, we have only found one general question related to the category. These initial questions reported the presence or otherwise of difficulty performing an activity. For each one of these questions, there was a follow up one reporting the level of difficulty suffered, which was used to weight the score of that category and ranged from moderate difficulties to not being able to perform the activity without help. To find the final score for every individual - which we named Long Term Care index (LTC index) - the score of every category was aggregated.

Formally, the LTC index for a person *i* ($S_i$) is calculated applying the following formula,

$$S_i = \sum_{j=1}^{10} D_j C_j P_j \quad [1]$$

where variable $D_j$ is a dichotomous variable with a value of 1 if individual *i* has difficulties performing any activity from group *j* and 0 in all other cases ($i = 1. . .N$; $j = 1. . .10$); variable $C_j$[6] is a categorical variable that takes a value of 0.9 if the activity of group *j* is performed with moderate[7] difficulties, 0.95 if it is performed with severe difficulties and 1 if it can't be performed without help; and variable $P_j$ considers the score established for group *j* according to the individual's age. As we mentioned, $P_j$ is determined by law.

The $S_i$ index ranges between 0 and 100. If the score is between 25 and 50, the individual will have moderate dependence (Grade 1) and require help at least once a day; if the score is between 50 and 75, the dependence is considered severe (Grade 2) and the individual will require help more than once a day, although not permanently. If the score is over 75, the individual has full dependence (Grade 3) and require permanent help. Finally, if the score is under 25, then the individual suffers some impairment but the severity is considered low and the Law establishes that the individual does not require the help of a third person (Grade 0). It is important to note that these are grades that we estimated according to the perception of the individuals interviewed, not the actual grade recognized by law. In fact, we don't have information about their actual recognized grade of dependence, or if they have one at all, since it's not presented in the survey.

The population studied here was all the individuals on to the survey sample who were 18 and older. The other individuals were excluded because it is difficult to identify chronic

[4] (Real Decreto 174/2011, de 11 de febrero, por el que se aprueba el baremo de valoración de la situación de dependencia establecido por la Ley 39/2006, de 14 de diciembre, de Promoción de la Autonomía Personal y Atención a las personas en situación de dependencia, 2011)

[5] The score for this group has been added to that of Washing up, due to the lack of information related to it in our data.

[6] If more than one activity of the same group j is performed with difficulties, Cj takes the value corresponding to the activity that represents the greatest difficulty in j (the maximum).

[7] Or there is no information about the level of difficulty.

or permanent dependence in individuals younger than 18. Numerous studies show that car accidents cause less disabilities among children than they do among adults (Clay et al., 1987). Similarly, Haukeland (1996) shows that adults face more severe health problems (with a consequent well-being diminution) than children do when presenting traffic injuries.

It's important to recall that here, dependence attributable to RTIs is deemed to exist when any of the 8 categories of limitations is presented as a consequence of a traffic accident. We calculate national prevalence estimates by incorporating the EDAD 2020 sample weights and using the 2020 Spanish Census estimates for population aged 18 years or older (INE, 2021). The analysis was conducted using R software. To estimate the prevalence of dependence (and the need for LTC) attributable to RTIs, we first have to calculate the score for each individual according to formula [1]. We refer to RTI-dependence when the limitations of one or more categories are attributable to an automobile accident.

An additional goal here is to estimate the costs incurred by citizens who require long-term care as a result of their RTIs. We compare the costs attributable specifically to road accidents and those attributable to other causes (all causes except road accidents).

Various studies have analyzed the economic impact of road traffic accidents by considering the direct and indirect costs to which such accidents give rise. Banstola et al. (2020) estimate that the total costs of RTIs in Nepal in 2017 were 122.88 million dollars. Zakeri et al. (2021) estimate that the average amount of RTI costs were US$8,701 per victim in Iran in 2016. Jaramillo et al. (2016) analyzed different studies of RTI costs through 2008 and 2013 and concluded that the indirect costs exceed direct costs, and LTC costs are poorly evaluated. Jacobs et al. (2004) estimate the total costs attributable to RTIs were over $117 million for 1999 in Alberta, Canada. López et al. (2004) indicate that the total cost of traffic accidents in Spain, including medical costs, insurance administration costs, costs of material damage to vehicles, premature mortality, short-term work absenteeism and long-term disability (early retirement pensions), represented 1.35% of the country's GDP in 1997 (about € 172.38 per person). In 2020 the burden on the national Spanish economy was estimated between €4,052 and €9,648 million, representing at least 0.36% of the country's GDP (Dirección General de Tráfico, 2021). Visibly, high socio-economic costs of road traffic accidents emphasize the need to identify requisite preventive measures.

To the best of our knowledge, excepting Alemany et al. (2013), no single study to date has quantified the costs derived from long-term care (third person help) when one of the causes of disability is RTI. To manage this calculation we use the same LTC-need scenarios they do, that have also already been employed in previous studies (Albarrán et al., 2005; Artís et al., 2007). In particular, we have chosen the same services provided to dependents according to their degree of dependence as in Artís et al. (2007). In Table 2, we show the average costs for formal long-term care services provided in Spain per hour or per year. Table 3 indicates that an individual with a moderate degree of dependence can be expected to require home help for around three hours per day; those with a severe degree of dependence need to receive support in a day care center and home help for around one hour per day (therefore they will incur a lower average expected cost than moderate dependents, as the same caregiver can visit several patients); those with full disability need constant supervision provided in a nursing home.

This distribution of services entails a very general approach, as it assumes all individuals with the same grade of dependence will need the same type and amount of help. Therefore, as shown in Table 3, we could also consider a second scenario of annual costs for Grade 2 and Grade 3 proposed by Del Pozo & Escribano (2013), since they use the average of the actual services provided in Spain according to the degree of dependence, resulting in a more realistic (and lower) calculation. However, we have not used this second scenario to estimate the annual LTC costs since it only considers Grade 2 and Grade 3, and mixing them with our Grade 1 estimation would result in an excessive weight of Grade 1 costs relative to the total.

**Table 2**
Annual and per hour cost of LTC services in Spain (in euros).

| | |
|---|---|
| Home help – public welfare services (per hour) | 14.88 |
| Day care for dependent individuals – public welfare services | 8,916.52 |
| Residential placement for dependent – public welfare services | 18,839.62 |

Source: own elaboration based on data from IMSERSO (2020).

**Table 3**
Estimated Annual LTC costs according to degree of dependence and LTC service type in Spain (in euros).

| | | |
|---|---|---|
| Moderate (Grade 1) | Home care service (3 h/day) | 16,293.60 |
| Severe (Grade 2) | Day care center and home service (1 h/day) | 14,347.72 |
| Full (Grade 3) | Nursing home | 18,839.62 |

Source: Based on data from IMSERSO (2020).

| | |
|---|---|
| Severe (Grade 2) | 7,945.22 |
| Full (Grade 3) | 11,511.60 |

Source: own elaboration based on (Del Pozo & Escribano, 2013) for Grade 2 and Grade 3, using CPI index.

## 3. Results

### 3.1 Prevalence of dependence

According to EDAD 2020 and the estimated Spanish population for people aged 18+ (INE, 2021), the prevalence of disabilities when considering all causes is about 10.86%. This figure falls to 0.24% if only RTIs are considered.[8] Recall that individuals are considered disabled when they suffer at least one of the 21 impairments and they are considered to suffer each type of impairment if the activities related to it are either performed with severe difficulty or can't be performed without help.[9] At the same time,

[8] The Spanish population aged 18 years and older is estimated at 39,156,566, according to the 2020 Spanish Population Census (Population on 01/01/2021) (INE,2021)

[9] Except for type 1 and type 5, which were automatically assigned each impairment in case of responding yes to the initial question (is blind, is deaf).

RTI-dependence is considered when any of the 8 categories of limitations is presented as a consequence of a traffic accident.

Table 4 presents the estimated prevalence of each of the 21 impairments included in Table 1 for every 100 disabled individuals when considering all possible causes of disability and for every 100 disabled individuals when considering only vehicle crash-related causes. A graphical comparison between the two rates is presented in Fig. 1, where it is evident that the prevalence of mobility impairments attributable to RTIs is notably higher than that associated with all causes. Specifically, we observe that, of those disabled as a result of RTIs, 60.47% have major difficulties moving outside of their home without help or supervision, including using or driving means of transport (type 14). Similarly, 50.56% have difficulties keeping the body in the same position for a while or changing positions without help or supervision (type 13), 36.52% have major difficulties lifting or carrying an object using hands and arms (Type 15) and 19.17% have major difficulties manipulating and moving objects using arms, hands and fingers (Type 16). These same individuals also face major difficulties when undertaking daily housework activities (type 20 – 44.09%) and organizing and buying clothes or other house items (type 19 – 43.77%). Finally, they also have major difficulties taking care of themselves, like dressing, undressing or feeding themselves, going to the bathroom or taking medicine without help or supervision (type 18 – 29.63%) and cleaning or drying themselves, taking showers or performing other basic body care activities (type 17 – 31.94%). For the remaining impairments (related to communication and other aspects), prevalence rates associated to RTIs are lower than those associated with any cause of disability.

**Table 4**

Estimated impairment prevalence rate for Spanish adults with disability, due to any cause and to RTIs (According to EDAD 2020 and the 2020 Spanish population census).

| Type of impairment* | **Prevalence per 100 disabled individuals related to any cause** | **Prevalence per 100 disabled individuals related to RTI** |
|---|---|---|
| **VISION/AUDITION/COMMUNICATION/ RELATIONSHIPS** | | |
| 1. Is blind. | 2.56 | 2.64 |
| 2. Has major difficulties seeing the letter of a newspaper when wearing glasses or contacts. | 12.84 | 5.93 |
| 3. Has major difficulties seeing a face at a 4 meter distance when wearing glasses or contact lenses. | 10.38 | 3.73 |
| 4. Has other major visual difficulties when wearing glasses or contact lenses. (night vision, colour differentiations, people blind in one eye…). | 6.48 | 3.24 |
| 5. Is deaf. | 3.03 | 1.95 |
| 6. Has major difficulties hearing what is being said in a conversation between multiple people without help. | 17.96 | 8.34 |
| 7. Has major difficulties hearing an alarm, siren or any other loud sound without help (or is deaf in one ear). | 9.34 | 4.61 |

| | | |
|---|---|---|
| 8. Has major difficulties speaking their usual language, holding a conversation or understanding the meaning of what other people say. | 10.27 | 7.47 |
| 9. Has major difficulties understanding written texts, expressing themselves through them or understanding gestures, drawings… (excluding those who didn't learn how to read or write but don't have any health issue or impairment). | 13.69 | 9.14 |
| 10. Has major difficulties using the telephone without help or supervision. | 16.52 | 10.65 |
| 21. Has major difficulties relating to other people, starting romantic relationships or starting a family. | 11.95 | 10.21 |
| **LEARNING** | | |
| 11. Has major difficulties paying attention with their eyes or sustaining attention with their ears. | 5.96 | 2.98 |
| 12. Has major difficulties learning or performing tasks without help or supervision. | 13.11 | 7.92 |
| **MOBILITY** | | |
| 13. Has major difficulties keeping the body in the same position for a while or changing positions without help or supervision. | 32.76 | 50.56 |
| 14. Has major difficulties moving outside of their home without help or supervision. (including using or driving means of transport). | 43.67 | 60.47 |
| 15. Has major difficulties lifting or carrying an object using hands and arms without help or supervision. | 21.77 | 36.52 |
| 16. Has major difficulties manipulating and moving objects using arms, hands and fingers without help or supervision. | 14.96 | 19.17 |
| **SELF CARE** | | |
| 17. Has major difficulties cleaning or drying themselves, taking showers or performing other basic body care activities without help or supervision. | 25.26 | 31.94 |
| 18. Has major difficulties dressing, undressing or feeding themselves, going to the bathroom or taking medicine without help or supervision. | 24.17 | 29.63 |
| **DOMESTIC LIFE** | | |
| 19. Has major difficulties organizing and buying food, clothes or other house items without help or supervision (older than 12) | 36.95 | 43.77 |
| 20. Has major difficulties undertaking daily housework activities without help or supervision. (older than 12) | 37.49 | 44.09 |

Source: own elaboration.

*Highest prevalence rates associated with RTI vs. any cause are shaded.

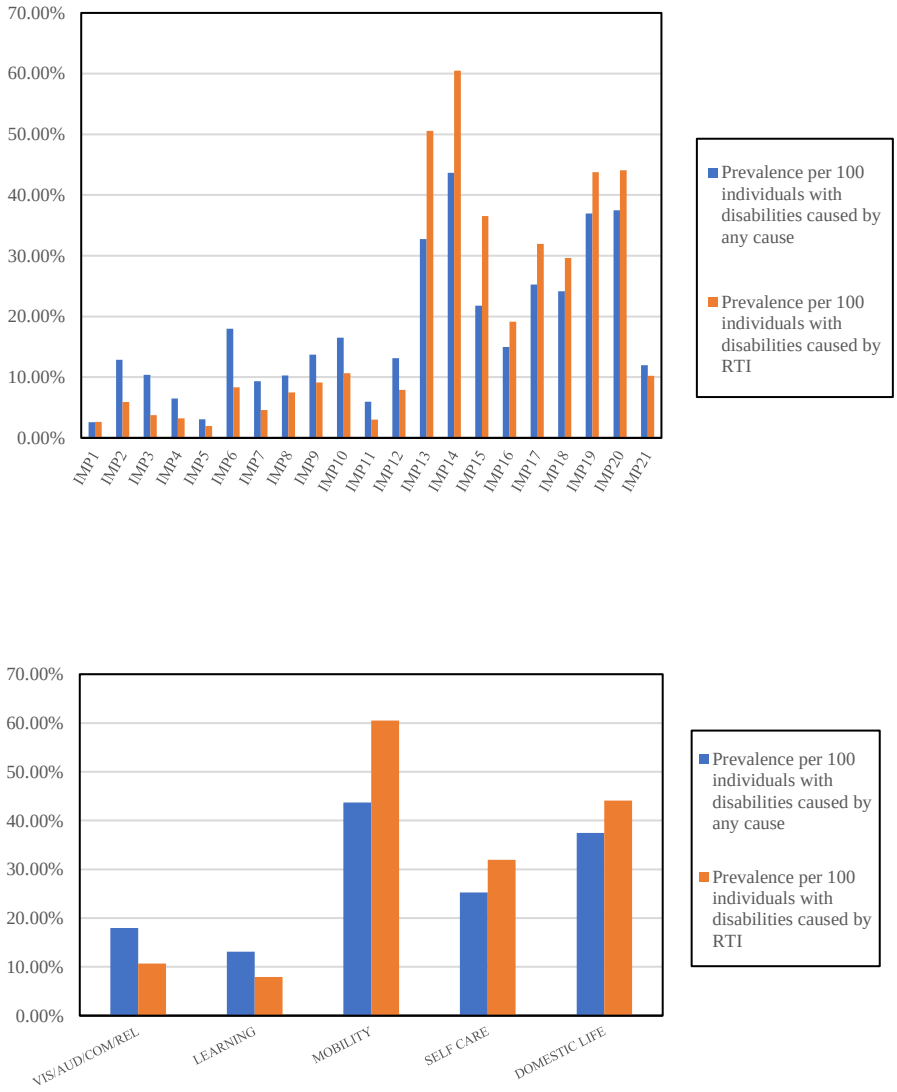


**Fig. 1.** Comparison between estimated prevalence rates for Spanish adults with a disability due to any cause and due to RTIs for each impairment (up) and for each category of limitations (down). For definition of impairments (IMP) see Table 4. Source: own elaboration.

Estimated rates of prevalence for RTI-dependence, and rates of prevalence for all other causes of disabilities (all causes except RTI) are arranged by age intervals and presented in Table 5. The first and third row of this table are shown graphically in Fig. 2. Fig. 2 also shows rates of prevalence obtained with data from 2008 (Alemany et al., 2013). We observe that the prevalence rate exhibits an exponential behaviour with age when analyzing all causes of disability except RTIs; however, the same does not hold for disabilities attributable to road accidents. In this case, significant increases are recorded between the ages of 25 and 54 and again after the age of 75, similarly to what Shults et al. (2004) reported, demonstrating that the prevalence of crash-related disabilities is highest among those in their mid-life years, aged 35–64. It is also noticeable in Fig. 2, given the differences in the shape of both graphs that prevalence rates for RTI-disability

have increased significantly between the ages of 45 and 54 and again after the age of 85 compared to 2008.

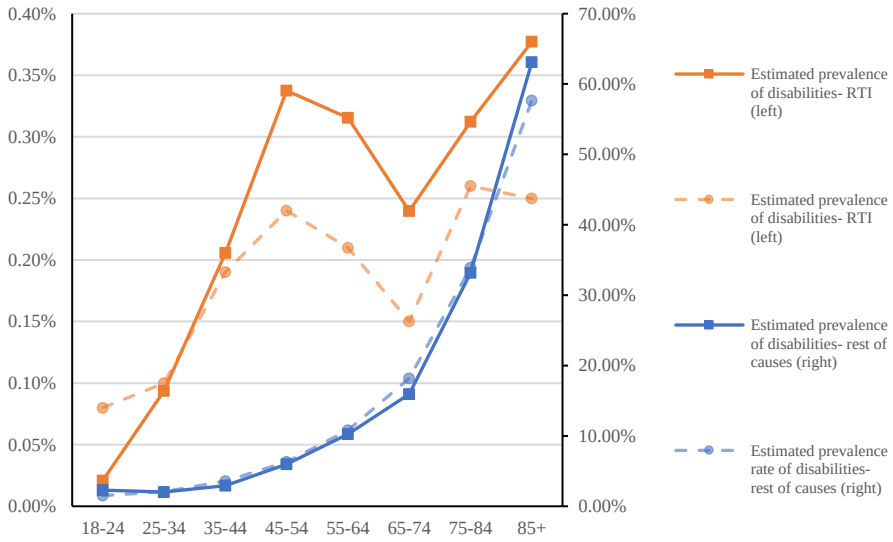


**Fig. 2.** Estimated prevalence of dependence in the Spanish adult population when RTIs and other causes are considered the cause of impairments. Source: own elaboration based on Table 5 herein. Left-hand scale: estimated prevalence of dependence attributable to RTIs; right-hand scale: estimated prevalence of dependence attributable to other causes. Dashed line represents the equivalent data from 2008.

**Table 5.**
Estimated prevalence of dependence when impairments attributable to RTIs only and when attributable to other causes, arranged by age intervals (in %). Variation compared to 2008 values (in %).

| | **18-24** | **25-34** | **35-44** | **45-54** | **55-64** | **65-74** | **75-84** | **85+** | **Total** |
|---|---|---|---|---|---|---|---|---|---|
| **Estimated prevalence rate of dependence-RTI** | 0.02 | 0.09 | 0.21 | 0.34 | 0.32 | 0.24 | 0.31 | 0.38 | 0.24 |
| **Variation** | -0.06 | -0.01 | +0.02 | +0.10 | +0.11 | +0.09 | +0.05 | +0.13 | +0.07 |
| **Estimated prevalence rate of depedence, other causes** | 2.27 | 2.02 | 2.94 | 5.98 | 10.23 | 15.96 | 33.18 | 63.11 | 10.63 |
| **Variation** | +0.75 | -0.03 | -0.62 | -0.30 | -0.57 | -2.22 | -0.71 | +5.45 | +1.11 |

Source: own elaboration

**Tabla 5 bis.**
Estimated prevalence of dependence when impairments attributable to RTIs only and when attributable to other causes, arranged by age intervals (in absolute values). Variation compared to 2008 values.

| | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85+ | Total |
|---|---|---|---|---|---|---|---|---|---|
| **Estimated number of dependents - RTI** | 686 | 4,912 | 14,498 | 25,663 | 20,236 | 11,180 | 9,309 | 5,196 | 91,679 |
| **Variation** | -2,367 | -2,939 | -24 | 10,726 | 9,826 | 5,471 | 1,798 | 2,851 | 26,868 |
| **Estimated number of dependents- rest of causes** | 74,193 | 106,083 | 207,216 | 454,669 | 656,391 | 743,853 | 989,125 | 869,379 | 4,100,910 |
| **Variation** | 16,188 | -54,864 | -64,889 | 63,813 | 121,029 | 51,954 | 10,022 | 328,505 | 471,467 |

Source: own elaboration.

Table 6 shows our results according to the four degrees of dependence (Grades 0, 1, 2 and 3), as defined in Section 2, when the disability is attributable to RTIs and when it is attributable to causes other than RTIs. A comparison of the prevalence of each degree of dependence among the Spanish disabled population can be found in Fig. 3.

It can be seen that for the 35-44 and the 45-54 age groups, the percentage of individuals with LTC needs arising from impairments attributable to RTIs are about 30 points higher than those with impairments not attributable to RTIs (note that the prevalence of Grade 0 in these age intervals, that is, no LTC needs, are 41.83% and 41.12% respectively when impairments are attributable to RTIs and 72.77% and 71.86% respectively when they are not). Notably, in all instances, the percentage of individuals with disabilities attributable to RTIs but with no LTC needs are lower than the equivalent figures for individuals with disabilities attributable to causes other than RTIs.

A high percentage of people disabled as a result of RTIs in the 18-34 age group present a severe to full degree of dependence (Grade 2 and 3), while among those aged between 35 and 64 there is a relatively high prevalence of the moderate degree of dependence (Grade 1) when traffic accidents are the cause of some or all disabilities. For example, in the 35-44 age group the prevalence of Grade 1 is 37.53% compared to 15.59% when RTIs are not included. However for Grade 3, the prevalence is also higher when compared to when RTIs are not included (13.22% vs. 5.22%). Except in the 25-34 age group, the prevalence of Grade 3 is always higher when the disability is attributable to RTIs compared to when RTIs are not included.

We observe that the severity of the dependence follows a similar behaviour whether the disability is attributable to RTIs or to other causes. The older people get, the higher the difference between the prevalence of the highest levels of dependence (Grade 2 and Grade 3) and the prevalence of moderate dependence (Grade 1) is. The main difference is that prevalence for Grade 2 and Grade 3 start to notably increase from ages 75 and up when the disability is attributable to causes other than RTIs, while they start notably increasing from the age of 65 when the disability is attributable to RTIs. Moreover, we can see that

this increase is notably higher when the disability is attributable to RTIs, especially for Grade 3. For instance, in the 85+ age group, the prevalence of Grade 3 is 70.14% compared to 30.40% when RTIs are not included.

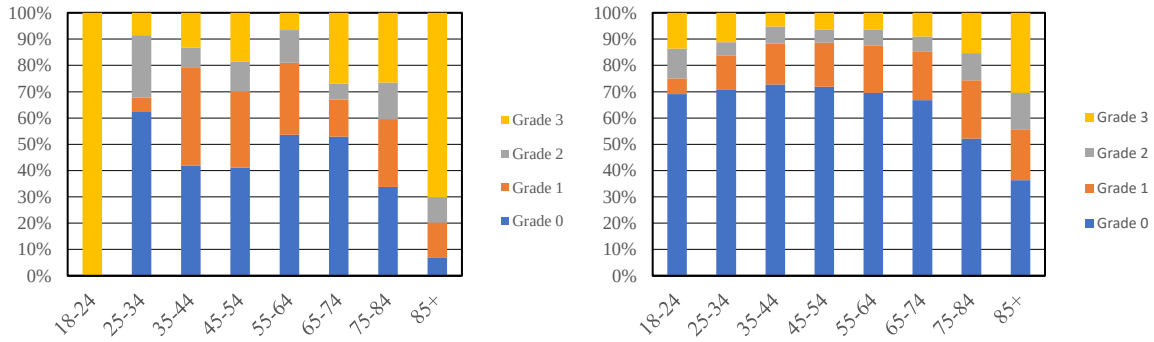


**Fig. 3.** Comparison of the prevalence of degree of dependence among the Spanish disabled adult population (disabilities attributable to RTIs in left graph and disabilities attributable to other causes in right graph), arranged by age intervals. Source: own elaboration.

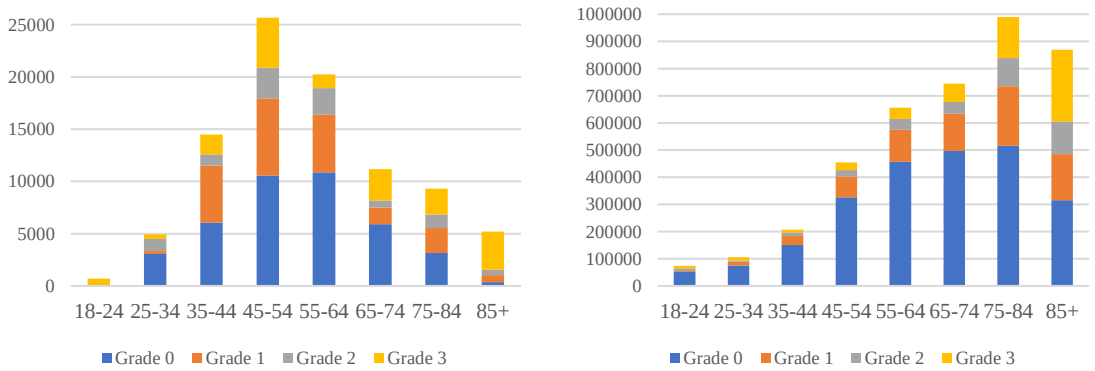


**Fig 3.** Comparison of the prevalence of degree of dependence among the Spanish disabled adult population (disabilities attributable to RTIs in left graph and disabilities attributable to other causes in right graph), arranged by age intervals (in absolute values). Source: own elaboration.

**Table 6**
Prevalence of the degree of dependence (LTC) among the Spanish disabled adult population, when the disability is attributable to RTIs and when it is attributable to other causes, arranged by age intervals.

| | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85+ | Total |
|---|---|---|---|---|---|---|---|---|---|
| **Impairments attributable to RTI** | | | | | | | | | |
| Grade 0 (%) | - | 62.30 | 41.83 | 41.12 | 53.65 | 52.92 | 33.81 | 7.00 | 43.59 |
| Grade 1 (%) | - | 5.39 | 37.53 | 28.77 | 27.34 | 14.14 | 25.85 | 13.22 | 25.41 |
| Grade 2 (%) | - | 23.83 | 7.42 | 11.44 | 12.46 | 6.01 | 13.76 | 9.64 | 11.08 |
| Grade 3 (%) | 100 | 8.48 | 13.22 | 18.67 | 6.54 | 26.92 | 26.58 | 70.14 | 19.92 |
| **Impairments attributable to other causes** | | | | | | | | | |
| Grade 0 (%) | 69.07 | 70.66 | 72.77 | 71.86 | 69.63 | 66.74 | 52.11 | 36.31 | 58.24 |
| Grade 1 (%) | 5.98 | 13.15 | 15.59 | 16.78 | 17.89 | 18.37 | 22.24 | 19.45 | 18.78 |
| Grade 2 (%) | 11.35 | 4.99 | 6.42 | 5.10 | 6.18 | 5.87 | 10.38 | 13.84 | 8.72 |
| Grade 3 (%) | 13.60 | 11.20 | 5.22 | 6.26 | 6.29 | 9.02 | 15.27 | 30.40 | 14.27 |

Source: own elaboration based on EDAD 2020 and formula [1]. Grade 0 – no help needed from third person; grade 1 - moderate dependence; grade 2 - severe dependence; grade 3 - full dependence.

### 3.2 Annual LTC costs attributable to RTIs

Based on the estimated prevalence of the degrees of dependence in the disabled adult population, we estimated the total annual (2020) LTC costs for individuals with disabilities attributable to RTIs and those with impairments attributable to other causes (Table 7). We find that when RTIs are included these costs rise to approximately 870 million euros, that is, 2.94% of the total annual cost of the estimated LTC needs for the adult Spanish dependent population and 0.08% of the Spanish GDP for 2020.[10] Note that the highest percentage of traffic accidents was suffered by individuals aged between 25 and 54, where LTC needs account for 5.21% (25-34 age group), 13.21% (35-44 age group) and 10.68% (45-54 age group) of total costs in each age group, in line with the estimated rates of dependence (Fig. 2). Above the age of 65, LTC costs attributable to RTIs are notably lower (less than 3% in all age groups).

Our results also present highly conclusive outcomes when analyzed according to the degree of dependence. Thus, Grade 3 individuals with a disability attributable to RTI in the 35-44 age group account for 15.05% of annual Grade 3 LTC costs, while this figure reaches 14.40% for individuals in the 45-54 age group. These percentage figures correspond approximately to 36 million euros for the former and 90 million euros for the latter. The costs associated with lower degrees of dependence should also be stressed. For example, Grade 1 individuals with a disability attributable to RTI in the 25-34 age group account for 1.86% (approximately 4.32 million euros) of the annual estimated Grade 1 LTC costs. At the same degree of dependence, this figure stands at 1.14% (approximately 25.77 million euros) for individuals in the 65-74 age group.

[10] Spain's estimated GDP in 2020 was 1,117,989 million euros. According to Table 7 the estimated 2020 LTC costs for the adult Spanish population represented 2.65% of the GDP.

**Table 7**
2020 estimated annual LTC costs by dependence levels when the disability is attributable to RTIs and when it is attributable to other causes in the Spanish population older than 18 years (results in millions of euros).

| | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85+ | Total |
|---|---|---|---|---|---|---|---|---|---|
| **Dependence attributable to RTI** | | | | | | | | | |
| Grade 1 | - | 4.32 | 88.67 | 120.32 | 90.15 | 25.77 | 39.21 | 11.19 | 379.61 |
| Grade 2 | - | 16.79 | 15.43 | 42.11 | 36.19 | 9.64 | 18.39 | 7.19 | 145.72 |
| Grade 3 | 12.92 | 7.84 | 36.11 | 90.28 | 24.94 | 56.71 | 46.62 | 68.66 | 344.07 |
| Total (a) | 12.92 | 28.95 | 140.20 | 252.70 | 151.27 | 92.11 | 104.21 | 87.04 | 869.41 |
| **Dependence attributable to other causes** | | | | | | | | | |
| Grade 1 | 72.24 | 227.34 | 526.21 | 1,243.17 | 1,913.17 | 2,226.84 | 3,583.76 | 2,755.56 | 12,548.28 |
| Grade 2 | 120.81 | 75.91 | 190.84 | 332.60 | 582.44 | 625.99 | 1,472.81 | 1,726.88 | 5,128.28 |
| Grade 3 | 190.15 | 223.76 | 203.85 | 536.59 | 778.14 | 1,264.38 | 2,845.70 | 4,978.75 | 11,021.33 |
| Total (b) | 383.21 | 527.01 | 920.90 | 2,112.36 | 3,273.75 | 4,117.21 | 7,902.26 | 9,461.19 | 28,697.89 |
| **Deppendence attributable to any cause** | | | | | | | | | |
| Grade1 | 72.24 | 231.65 | 614.87 | 1,363.48 | 2,003.33 | 2,252.60 | 3,622.96 | 2,766.75 | 12,927.89 |
| Grade 2 | 120.81 | 92.70 | 206.27 | 374.71 | 618.62 | 635.63 | 1,491.19 | 1,734.06 | 5,274.00 |
| Grade 3 | 203.07 | 231.60 | 239.96 | 626.87 | 803.08 | 1,321.09 | 2,892.32 | 5,047.42 | 11,365.41 |
| Total (c) | 396.12 | 555.96 | 1,061.10 | 2,365.06 | 3,425.03 | 4,209.32 | 8,006.47 | 9,548.23 | 29,567.30 |
| Costs due to RTI (a)/total (c) (%) | 3.26 | 5.21 | 13.21 | 10.68 | 4.42 | 2.19 | 1.30 | 0.91 | 2.94 |
| Total costs due to any cause (c)/GDP (%) | 0.035 | 0.050 | 0.095 | 0.212 | 0.306 | 0.377 | 0.716 | 0.854 | 2.645 |
| Costs due to RTI (a)/GDP (%) | 0.001 | 0.003 | 0.013 | 0.023 | 0.014 | 0.008 | 0.009 | 0.008 | 0.078 |
| Cost Grade 1 (RTI) / total cost Grade 1 (any cause) (%) | - | 1.86 | 14.42 | 8.82 | 4.50 | 1.14 | 1.08 | 0.40 | 2.94 |
| Cost Grade 2 (RTI) / total cost Grade 2 (any cause) (%) | - | 18.11 | 7.48 | 11.24 | 5.85 | 1.52 | 1.23 | 0.41 | 2.76 |
| Cost Grade 3 (RTI) / total cost Grade 3 (any cause) (%) | 6.36 | 3.39 | 15.05 | 14.40 | 3.11 | 4.29 | 1.61 | 1.36 | 3.03 |

Source: own elaboration based on data from IMSERSO (2020) and estimated rates of degrees of dependence (Table 6). The calculations do not include Grade 0 as no public coverage is recognized for this level of dependence. Domestic Product 2020: 1,117,989 million euros. Note that a+b=c.

### 3.3 Present actuarial valuation of a dependence situation

In this section, we aim to study various situations of full dependency (Grade 3) caused by RTIs, analyzing what this dependency economically entails for the disabled throughout their life and thus, estimating the economic compensation they should receive, known as loss of earnings compensation.

The concept of loss of earnings compensation appears in Spain in the System for the valuation of damages and harm caused to people in traffic accidents, also known as the Traffic Indemnity Scale, with the latest reform in Law 35/2015, of September 22nd[11]. The amount of loss of earnings compensation that appears in the Scale depends on the injured party's net income, their age, the public disability pensions they are entitled to, the duration of the harm, the risk of death according to their degree of disability, and the discount interest rate, which takes inflation into account. The calculation we propose here follows this same idea, but also considers the compensation the disabled receives for their sequelae and an additional expense for the annual cost of a place in a public nursing home (assistance estimated for Grade 3 disabled individuals).

To better understand how to calculate this compensation, we have studied how the new Spanish Scale works. It is relevant to note that its purpose is to achieve full compensation for the damages suffered, both personal and patrimonial, to place the victim in a position as close as possible to the one they would have had if the accident had not occurred. The main goals of the reform are equity, sufficiency and efficiency. To achieve them, the calculation of the loss of earnings compensation introduces actuarial criteria, and also considers injured individuals pending access to the labor market under thirty years old and unpaid work related to household chores.

To conduct our calculation, we have considered certain information derived from the Scale. For the valuation of the sequelae compensation, table 2.A.2 of the 2020 Scale has been used. This table provides the economic compensation based on the age of the affected person and the score obtained in the evaluation of their sequelae (Table 2.A.1 of the Scale). This score can range from 0 to 100. It is important to note that the data we obtain from the EDAD 2020 survey does not contain information about the specific physical sequelae of each disabled person, so we have established a score of 80 for all the scenarios considered (corresponding to Grade 3 according to our calculation, which also ranges from 0 to 100) to determine the compensation value.

Tables 2.B establish the amount of particular and exceptional personal damages, which we did not take into account. Furthermore, the Scale considers expenses for the loss of personal autonomy, as outlined in tables 2.C.2 and 2.C.3, which assign daily hours of need for assistance from a third person according to the sequelae and their corresponding compensation according to age and the number of hours assigned, respectively. These expenses have not been taken into account for the proposed calculation, as it is only carried out for people with Grade 3 dependency, who we estimated require constant assistance in a nursing home.

Tables 2.C.4, 2.C.5, 2.C.6, 2.C.7 and 2.C.8 contain the loss of earnings compensation according to the level of incapacity to work, age and loss of income. Table TT1 contains

[11] (Ley 35/2015, de 22 de septiembre, de reforma del sistema para la valoración de los daños y perjuicios causados a las personas en accidentes de circulación, 2015)

actuarial conversion coefficients, according to age and whether the accident results in death, sequelae in general or sequelae resulting in loss of autonomy leading to severe or very severe loss of quality of life. This coefficients can be used to convert a capital into an annual annuity income or vice versa. Finally, Table TT2 contains life expectancy in years according to age and general sequelae or sequelae with loss of autonomy leading to severe or very severe loss of quality of life.

Thus, our calculation of loss of earnings compensation (LoEC) is based on four concepts: loss of earnings (LoE), cost of dependency (CoD), disability benefits (DB), and sequelae compensation (SC). For each Grade 3 disabled individual $i$, it is:

$$LoEC_i = LoE_i + CoD_i - DB_i - SC_i$$

Where $LoE_i$ is the actuarial present value (APV) of the salary and retirement pension that the disabled person ceases to receive; $CoD_i$ is the APV of the cost of a place in a public nursing home borne by the disabled; $DB_i$ is the APV of the benefits and aids the disabled receives for being disabled and dependent; $SC_i$ is the amount of sequelae compensation, paid in full at the time of the valuation.

Before discussing the results obtained in the different scenarios, we will describe the amounts used to calculate each concept. For LoE, the average salary in Spain for 2020 by age intervals has been considered, which would be received until the retirement age (65 years in 2020, assuming 37 or more years of contributions (Ministerio de Inclusión, Seguridad Social y Migraciones, 2024a)). From the age of 66, the average contributory retirement pension in 2020 has been considered. For CoD, the estimated cost for Grade 3, corresponding to a place in a public nursing home has been used (€18,839.62 per year), considering that the average cost borne by the user is 42.6% of the total annual price (IMSERSO, 2020).

For DB, we have studied the existing permanent disability benefits and pensions in Spain, both contributory and non-contributory. On one hand, there are three types of contributory pensions for permanent disability: total permanent disability, absolute permanent disability, and severe disability (Ministerio de Inclusión, Seguridad Social y Migraciones, 2024b). Total disability incapacitates the worker from performing their usual profession but allows them to engage in a different one; absolute disability incapacitates the worker from any profession; severe disability refers to a situation of permanent disability where the individual also needs assistance from a third person for essential daily activities such as dressing, moving around, eating, or similar. On the other hand, there are various dependency aids, ranging from social and health services such as telecare or home help, to economic benefits linked to a service to compensate for cases where access to a public service is not possible (CUIDOPIA, 2020). The amount of these aids varies depending on the beneficiary's degree of dependency and economic capacity, as well as the Autonomous Community they live in. However, there are maximum amounts for each grade at a national level. Due to the heterogeneity of the calculations of these aids' amounts and the lack of data on the national average amount, an estimate of the average aid for Grade 3 disabled individuals who attend a nursing home in Spain in 2021 (€531 per month in 12 payments) has been taken as a reference (Sosa Troya, 2022).

For the contributory benefit for permanent disability, it has been considered that we are studying individuals with full dependency, meaning people who cannot perform any job and need constant assistance for daily activities. Therefore, the severe disability benefit

would be the most appropriate. However, it is noteworthy that the severe disability benefit corresponds to the total or absolute disability benefit increased by a supplement to remunerate the person attending the disabled individual. Although it is true that the severe disability benefit and the great dependency aid can be received simultaneously, receiving a dependency aid could reduce the supplement received for severe disability, as both practically serve the same purpose. Therefore, to avoid overestimating the benefits the disabled will receive, we decided to consider the great dependency aid and the absolute permanent disability benefit (without considering the supplement), which corresponds to 100% of the beneficiary's regulatory base (Ministerio de Inclusión, Seguridad Social y Migraciones, 2024b). The average amount for 2020 is €1,205.37 per month paid in 14 payments (INSS, 2020).

Finally, SC corresponds to the compensation that the disabled person receives due to the sequelae caused by the traffic accident, an amount assigned based on the individual's age and their score, according to the economic scale (Table 2.A.2). This amounts are adjusted yearly, thus we used the 2020 values (DGSFP, 2020).

For LoE, CoD, and DB, we must consider factors such as inflation and the revaluation of pensions. Additionally, for the APV, we must consider the individual's survival probabilities and the discount interest rate. Assuming that wages, pensions, and public nursing home costs increase in line with inflation, we can assume an approximate inflation rate of 2% equivalent to the discount interest rate. Thus, we only need to apply survival probabilities to the amounts. We will have:

$$LoE_i = \sum_{t=0}^{e} Earnings_{x+t} \cdot \ {}_tp_x \cdot \frac{(1+\pi)^t}{(1+i)^t}$$

Where $x$ is the age of individual $i$ at the time of valuation and occurrence of the traffic accident; $Earnings_{x+t}$ is the average salary of each individual at age x+t up to 65 years old, and the average retirement pension from 66 years old onward; ${}_tp_x$ is the probability of an individual aged $x$ living until the age of x+t; $\pi$ is the inflation rate; $i$ is the discount interest rate, and e[12] is the life expectancy of the individual at age x. The survival tables used are the PER2020, 1st order. Thus, if we assume $\pi \approx i \approx 2\%$, the resulting expression is:

$$LoE_i = \sum_{t=0}^{e} Earnings_{x+t} \cdot \ {}_tp_x$$

Similarly,

$$CoD_i = \sum_{t=0}^{e} 0.426 \cdot 18{,}839.62 \cdot \ {}_tp_x$$

[12] Note that we have not used table TT2 from the Scale to calculate DB due to the fact that life expectancy in table TT2 is in added values, and we do not know the survival probabilities used for its calculations. Instead, we have considered the life expectancy of a non-disabled individual at every age. Moreover, there are no significant differences between the two criteria.

$$DB_i = \sum_{t=0}^{e} (1{,}205.37 \cdot 14 + 531 \cdot 12) \cdot \ {}_tp_x$$

As already mentioned, $SC_i$ is a lump sum provided at the moment of valuation, therefore, it does not need to be revalued nor adjusted for time or survival probabilities.

Let us examine in detail one scenario, so that the calculation process conducted using Excel and shown in Fig. 4 and Fig. 5 becomes clear. In this scenario, we have a man aged 20, with a score of 80 and a life expectancy of 62.6 years (INE, 2022b)[13]. To calculate the LoE, first we need the average salary for every age until the age of 65 (INE, 2022a) and the average contributory retirement pension until the age of 83 (~20+62.6): €1,161.80 per month in 14 payments (Ministerio de Trabajo y Economía Social, 2020). Next, we need to calculate the APV of each of these quantities. To do so, as previously seen, we use the 1st order survival table PER2020[14] for people born in the year 2000 to calculate the survival probabilities. Every amount that the individual ceases to receive at the age of 20+t, is multiplied by ${}_tp_{20}$ (probability of an man aged 20 surviving until the age of 20+t), where t=0,…63. Every ${}_tp_{20}$ is obtained as the total living population (male) at age 20+t ($l_{20+t}$) divided by the total living population (male) at age 20 ($l_{20}$), both values from the corresponding 1st order PER2020 survival table. Finally, aggregating every year's APV, we obtain that the LoE for this individual ascends to €1,361,591.25.

[13] We have used general life expectancies for all scenarios, considering that all the average values we use are also not differentiated by sex.

[14] The sex is considered when we calculate the survival probabilities. Thus, survival probabilities for women are higher.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Age | Salary | Pension | lx man | tpx | Salary AV | Pension AV | LoE |
| 2 | TOTAL | 1094602.8 | 292773.6 | | | 1085962.884 | 275628.3647 | 1361591.248 |
| 3 | 20 | 12925.08 | | 994972.3141 | 1 | 12925.08 | 0 | |
| 4 | 21 | 12925.08 | | 994826.906 | 0.999853857 | 12923.19109 | 0 | |
| 5 | 22 | 12925.08 | | 994674.6918 | 0.999700874 | 12921.21377 | 0 | |
| 6 | 23 | 12925.08 | | 994519.4423 | 0.99954484 | 12919.19702 | 0 | |
| 7 | 24 | 12925.08 | | 994363.3669 | 0.999387976 | 12917.16954 | 0 | |
| 8 | 25 | 18372.47 | | 994208.9923 | 0.999232821 | 18358.37503 | 0 | |
| 9 | 26 | 18372.47 | | 994057.4932 | 0.999080556 | 18355.57755 | 0 | |
| 10 | 27 | 18372.47 | | 993908.8819 | 0.998931194 | 18352.8334 | 0 | |
| 11 | 28 | 18372.47 | | 993762.6731 | 0.998784246 | 18350.13361 | 0 | |
| 12 | 29 | 18372.47 | | 993618.9075 | 0.998639754 | 18347.47893 | 0 | |
| 13 | 30 | 21321.13 | | 993476.2559 | 0.998496382 | 21289.07117 | 0 | |
| 14 | 31 | 21321.13 | | 993333.9804 | 0.998353388 | 21286.02236 | 0 | |
| 15 | 32 | 21321.13 | | 993191.4335 | 0.99821012 | 21282.96774 | 0 | |
| 16 | 33 | 21321.13 | | 993047.6488 | 0.998065609 | 21279.8866 | 0 | |
| 17 | 34 | 21321.13 | | 992902.1706 | 0.997919396 | 21276.76917 | 0 | |
| 18 | 35 | 23671.27 | | 992754.2402 | 0.997770718 | 23618.50006 | 0 | |
| 19 | 36 | 23671.27 | | 992602.4908 | 0.997618202 | 23614.88981 | 0 | |
| 20 | 37 | 23671.27 | | 992445.7377 | 0.997460657 | 23611.16052 | 0 | |
| 21 | 38 | 23671.27 | | 992282.3042 | 0.997296397 | 23607.27229 | 0 | |
| 22 | 39 | 23671.27 | | 992110.1113 | 0.997123334 | 23603.17567 | 0 | |
| 23 | 40 | 26125.41 | | 991926.4549 | 0.99693875 | 26045.43358 | 0 | |
| 24 | 41 | 26125.41 | | 991729.002 | 0.996740299 | 26040.24898 | 0 | |
| 25 | 42 | 26125.41 | | 991515.1991 | 0.996525416 | 26034.63506 | 0 | |
| 26 | 43 | 26125.41 | | 991277.4137 | 0.996286429 | 26028.39143 | 0 | |
| 27 | 44 | 26125.41 | | 991010.6256 | 0.996018293 | 26021.38626 | 0 | |
| 28 | 45 | 27279.93 | | 990709.7405 | 0.995715887 | 27163.0597 | 0 | |
| 29 | 46 | 27279.93 | | 990367.8549 | 0.995372274 | 27153.68596 | 0 | |
| 30 | 47 | 27279.93 | | 989976.9962 | 0.99497944 | 27142.96948 | 0 | |
| 31 | 48 | 27279.93 | | 989527.268 | 0.99452744 | 27130.63893 | 0 | |
| 32 | 49 | 27279.93 | | 989007.2283 | 0.994004772 | 27116.3806 | 0 | |
| 33 | 50 | 27754.07 | | 988404.4996 | 0.993398998 | 27570.86532 | 0 | |
| 34 | 51 | 27754.07 | | 987708.5006 | 0.992699482 | 27551.4509 | 0 | |
| 35 | 52 | 27754.07 | | 986910.29 | 0.991897238 | 27529.18537 | 0 | |
| 36 | 53 | 27754.07 | | 986004.6093 | 0.990986981 | 27503.92203 | 0 | |
| 37 | 54 | 27754.07 | | 984990.2166 | 0.989967462 | 27475.62624 | 0 | |
| 38 | 55 | 28713.98 | | 983869.9236 | 0.988841508 | 28393.57528 | 0 | |
| 39 | 56 | 28713.98 | | 982647.532 | 0.98761294 | 28358.2982 | 0 | |
| 40 | 57 | 28713.98 | | 981326.7133 | 0.986285447 | 28320.18059 | 0 | |
| 41 | 58 | 28713.98 | | 979910.0403 | 0.984861615 | 28279.29672 | 0 | |
| 42 | 59 | 28713.98 | | 978399.8762 | 0.98334382 | 28235.71478 | 0 | |
| 43 | 60 | 27390.57 | | 976800.0059 | 0.981735865 | 26890.30494 | 0 | |
| 44 | 61 | 27390.57 | | 975114.2982 | 0.98004164 | 26843.89913 | 0 | |
| 45 | 62 | 27390.57 | | 973348.2651 | 0.978266683 | 26795.28205 | 0 | |
| 46 | 63 | 27390.57 | | 971372.2422 | 0.976280675 | 26740.88416 | 0 | |
| 47 | 64 | 27390.57 | | 969212.2092 | 0.974109727 | 26681.42066 | 0 | |
| 48 | 65 | 26833.25 | | 966900.3639 | 0.9717862 | 26076.18204 | 0 | |
| 49 | 66 | 0 | 16265.2 | 964485.0744 | 0.969358706 | 0 | 15766.81322 | |
| 50 | 67 | 0 | 16265.2 | 962020.0771 | 0.966881252 | 0 | 15726.51695 | |
| 51 | 68 | 0 | 16265.2 | 959536.8787 | 0.964385506 | 0 | 15685.92313 | |
| 52 | 69 | 0 | 16265.2 | 957058.3772 | 0.96189448 | 0 | 15645.4061 | |
| 53 | 70 | 0 | 16265.2 | 954582.6234 | 0.959406216 | 0 | 15604.93399 | |
| 54 | 71 | 0 | 16265.2 | 952072.972 | 0.956883884 | 0 | 15563.90774 | |
| 55 | 72 | 0 | 16265.2 | 949474.4843 | 0.954272266 | 0 | 15521.42925 | |
| 56 | 73 | 0 | 16265.2 | 946727.6624 | 0.951511564 | 0 | 15476.52588 | |
| 57 | 74 | 0 | 16265.2 | 943710.7282 | 0.948479385 | 0 | 15427.20689 | |
| 58 | 75 | 0 | 16265.2 | 940352.0046 | 0.945103689 | 0 | 15372.30052 | |
| 59 | 76 | 0 | 16265.2 | 936574.8609 | 0.941307459 | 0 | 15310.55408 | |
| 60 | 77 | 0 | 16265.2 | 932305.4651 | 0.93701649 | 0 | 15240.76061 | |
| 61 | 78 | 0 | 16265.2 | 927431.2396 | 0.932117634 | 0 | 15161.07974 | |
| 62 | 79 | 0 | 16265.2 | 921868.4109 | 0.926526696 | 0 | 15070.14202 | |
| 63 | 80 | 0 | 16265.2 | 915472.4887 | 0.920098455 | 0 | 14965.58538 | |
| 64 | 81 | 0 | 16265.2 | 908062.0767 | 0.912650597 | 0 | 14844.44449 | |
| 65 | 82 | 0 | 16265.2 | 899494.3663 | 0.904039593 | 0 | 14704.38479 | |
| 66 | 83 | 0 | 16265.2 | 889466.1635 | 0.893960717 | 0 | 14540.44986 | |

**Fig 4.** Excel screenshot of the LoE calculation for a man aged 20, with a score of 80 and life expectancy of 63 years. Source: own elaboration.

| | A | D | E | J |
|---|---|---|---|---|
| 1 | Age | lx man | tpx | CoD |
| 2 | TOTAL | | | 502273.3948 |
| 3 | 20 | 994972.3141 | 1 | 8020.13 |
| 4 | 21 | 994826.906 | 0.999853857 | 8018.957915 |
| 5 | 22 | 994674.6918 | 0.999700874 | 8017.730969 |
| 6 | 23 | 994519.4423 | 0.99954484 | 8016.479556 |
| 7 | 24 | 994363.3669 | 0.999387976 | 8015.221485 |
| 8 | 25 | 994208.9923 | 0.999232821 | 8013.977125 |
| 9 | 26 | 994057.4932 | 0.999080556 | 8012.755942 |
| 10 | 27 | 993908.8819 | 0.998931194 | 8011.558038 |
| 11 | 28 | 993762.6731 | 0.998784246 | 8010.379499 |
| 12 | 29 | 993618.9075 | 0.998639754 | 8009.220654 |
| 13 | 30 | 993476.2559 | 0.998496382 | 8008.070789 |
| 14 | 31 | 993333.9804 | 0.998353388 | 8006.923954 |
| 15 | 32 | 993191.4335 | 0.99821012 | 8005.774933 |
| 16 | 33 | 993047.6488 | 0.998065609 | 8004.615934 |
| 17 | 34 | 992902.1706 | 0.997919396 | 8003.443284 |
| 18 | 35 | 992754.2402 | 0.997770718 | 8002.250868 |
| 19 | 36 | 992602.4908 | 0.997618202 | 8001.027668 |
| 20 | 37 | 992445.7377 | 0.997460657 | 7999.764135 |
| 21 | 38 | 992282.3042 | 0.997296397 | 7998.446754 |
| 22 | 39 | 992110.1113 | 0.997123334 | 7997.058766 |
| 23 | 40 | 991926.4549 | 0.99693875 | 7995.578375 |
| 24 | 41 | 991729.002 | 0.996740299 | 7993.986775 |
| 25 | 42 | 991515.1991 | 0.996525416 | 7992.263384 |
| 26 | 43 | 991277.4137 | 0.996286429 | 7990.346677 |
| 27 | 44 | 991010.6256 | 0.996018293 | 7988.196189 |
| 28 | 45 | 990709.7405 | 0.995715887 | 7985.770859 |
| 29 | 46 | 990367.8549 | 0.995372274 | 7983.015036 |
| 30 | 47 | 989976.9962 | 0.99497944 | 7979.864458 |
| 31 | 48 | 989527.268 | 0.99452744 | 7976.239354 |
| 32 | 49 | 989007.2283 | 0.994004772 | 7972.047493 |
| 33 | 50 | 988404.4996 | 0.993398998 | 7967.189103 |
| 34 | 51 | 987708.5006 | 0.992699482 | 7961.578894 |
| 35 | 52 | 986910.29 | 0.991897238 | 7955.144793 |
| 36 | 53 | 986004.6093 | 0.990986981 | 7947.844413 |
| 37 | 54 | 984990.2166 | 0.989967462 | 7939.667741 |
| 38 | 55 | 983869.9236 | 0.988841508 | 7930.637444 |
| 39 | 56 | 982647.532 | 0.98761294 | 7920.784166 |
| 40 | 57 | 981326.7133 | 0.986285447 | 7910.1375 |
| 41 | 58 | 979910.0403 | 0.984861615 | 7898.718185 |
| 42 | 59 | 978399.8762 | 0.98334382 | 7886.545271 |
| 43 | 60 | 976800.0059 | 0.981735865 | 7873.649266 |
| 44 | 61 | 975114.2982 | 0.98004164 | 7860.061355 |
| 45 | 62 | 973348.2651 | 0.978266683 | 7845.825969 |
| 46 | 63 | 971372.2422 | 0.976280675 | 7829.897928 |
| 47 | 64 | 969212.2092 | 0.974109727 | 7812.486644 |
| 48 | 65 | 966900.3639 | 0.9717862 | 7793.851653 |
| 49 | 66 | 964485.0744 | 0.969358706 | 7774.382835 |
| 50 | 67 | 962020.0771 | 0.966881252 | 7754.513338 |
| 51 | 68 | 959536.8787 | 0.964385506 | 7734.497129 |
| 52 | 69 | 957058.3772 | 0.96189448 | 7714.51878 |
| 53 | 70 | 954582.6234 | 0.959406216 | 7694.562579 |
| 54 | 71 | 952072.972 | 0.956883884 | 7674.333141 |
| 55 | 72 | 949474.4843 | 0.954272266 | 7653.387625 |
| 56 | 73 | 946727.6624 | 0.951511564 | 7631.246437 |
| 57 | 74 | 943710.7282 | 0.948479385 | 7606.927967 |
| 58 | 75 | 940352.0046 | 0.945103689 | 7579.85445 |
| 59 | 76 | 936574.8609 | 0.941307459 | 7549.408192 |
| 60 | 77 | 932305.4651 | 0.93701649 | 7514.994059 |
| 61 | 78 | 927431.2396 | 0.932117634 | 7475.704602 |
| 62 | 79 | 921868.4109 | 0.926526696 | 7430.864551 |
| 63 | 80 | 915472.4887 | 0.920098455 | 7379.309219 |
| 64 | 81 | 908062.0767 | 0.912650597 | 7319.576434 |
| 65 | 82 | 899494.3663 | 0.904039593 | 7250.515064 |
| 66 | 83 | 889466.1635 | 0.893960717 | 7169.681166 |

| | A | D | E | I |
|---|---|---|---|---|
| 1 | Age | lx man | tpx | DB |
| 2 | TOTAL | | | 1455891.615 |
| 3 | 20 | 994972.3141 | 1 | 23247.18 |
| 4 | 21 | 994826.906 | 0.999853857 | 23243.78259 |
| 5 | 22 | 994674.6918 | 0.999700874 | 23240.22616 |
| 6 | 23 | 994519.4423 | 0.99954484 | 23236.59881 |
| 7 | 24 | 994363.3669 | 0.999387976 | 23232.95216 |
| 8 | 25 | 994208.9923 | 0.999232821 | 23229.34525 |
| 9 | 26 | 994057.4932 | 0.999080556 | 23225.80553 |
| 10 | 27 | 993908.8819 | 0.998931194 | 23222.33328 |
| 11 | 28 | 993762.6731 | 0.998784246 | 23218.91716 |
| 12 | 29 | 993618.9075 | 0.998639754 | 23215.55813 |
| 13 | 30 | 993476.2559 | 0.998496382 | 23212.22512 |
| 14 | 31 | 993333.9804 | 0.998353388 | 23208.9009 |
| 15 | 32 | 993191.4335 | 0.99821012 | 23205.57035 |
| 16 | 33 | 993047.6488 | 0.998065609 | 23202.21087 |
| 17 | 34 | 992902.1706 | 0.997919396 | 23198.81182 |
| 18 | 35 | 992754.2402 | 0.997770718 | 23195.35548 |
| 19 | 36 | 992602.4908 | 0.997618202 | 23191.80991 |
| 20 | 37 | 992445.7377 | 0.997460657 | 23188.14743 |
| 21 | 38 | 992282.3042 | 0.997296397 | 23184.32886 |
| 22 | 39 | 992110.1113 | 0.997123334 | 23180.30563 |
| 23 | 40 | 991926.4549 | 0.99693875 | 23176.01457 |
| 24 | 41 | 991729.002 | 0.996740299 | 23171.40115 |
| 25 | 42 | 991515.1991 | 0.996525416 | 23166.40572 |
| 26 | 43 | 991277.4137 | 0.996286429 | 23160.84994 |
| 27 | 44 | 991010.6256 | 0.996018293 | 23154.61653 |
| 28 | 45 | 990709.7405 | 0.995715887 | 23147.58646 |
| 29 | 46 | 990367.8549 | 0.995372274 | 23139.59842 |
| 30 | 47 | 989976.9962 | 0.99497944 | 23130.46614 |
| 31 | 48 | 989527.268 | 0.99452744 | 23119.9584 |
| 32 | 49 | 989007.2283 | 0.994004772 | 23107.80786 |
| 33 | 50 | 988404.4996 | 0.993398998 | 23093.72531 |
| 34 | 51 | 987708.5006 | 0.992699482 | 23077.46354 |
| 35 | 52 | 986910.29 | 0.991897238 | 23058.81363 |
| 36 | 53 | 986004.6093 | 0.990986981 | 23037.65272 |
| 37 | 54 | 984990.2166 | 0.989967462 | 23013.95178 |
| 38 | 55 | 983869.9236 | 0.988841508 | 22987.77653 |
| 39 | 56 | 982647.532 | 0.98761294 | 22959.21578 |
| 40 | 57 | 981326.7133 | 0.986285447 | 22928.35531 |
| 41 | 58 | 979910.0403 | 0.984861615 | 22895.25524 |
| 42 | 59 | 978399.8762 | 0.98334382 | 22859.97079 |
| 43 | 60 | 976800.0059 | 0.981735865 | 22822.59038 |
| 44 | 61 | 975114.2982 | 0.98004164 | 22783.2044 |
| 45 | 62 | 973348.2651 | 0.978266683 | 22741.94166 |
| 46 | 63 | 971372.2422 | 0.976280675 | 22695.77258 |
| 47 | 64 | 969212.2092 | 0.974109727 | 22645.30416 |
| 48 | 65 | 966900.3639 | 0.9717862 | 22591.2887 |
| 49 | 66 | 964485.0744 | 0.969358706 | 22534.85631 |
| 50 | 67 | 962020.0771 | 0.966881252 | 22477.26251 |
| 51 | 68 | 959536.8787 | 0.964385506 | 22419.24345 |
| 52 | 69 | 957058.3772 | 0.96189448 | 22361.33413 |
| 53 | 70 | 954582.6234 | 0.959406216 | 22303.48901 |
| 54 | 71 | 952072.972 | 0.956883884 | 22244.85188 |
| 55 | 72 | 949474.4843 | 0.954272266 | 22184.13913 |
| 56 | 73 | 946727.6624 | 0.951511564 | 22119.96059 |
| 57 | 74 | 943710.7282 | 0.948479385 | 22049.47098 |
| 58 | 75 | 940352.0046 | 0.945103689 | 21970.99558 |
| 59 | 76 | 936574.8609 | 0.941307459 | 21882.74394 |
| 60 | 77 | 932305.4651 | 0.93701649 | 21782.991 |
| 61 | 78 | 927431.2396 | 0.932117634 | 21669.10642 |
| 62 | 79 | 921868.4109 | 0.926526696 | 21539.13288 |
| 63 | 80 | 915472.4887 | 0.920098455 | 21389.69439 |
| 64 | 81 | 908062.0767 | 0.912650597 | 21216.55271 |
| 65 | 82 | 899494.3663 | 0.904039593 | 21016.37115 |
| 66 | 83 | 889466.1635 | 0.893960717 | 20782.0657 |

**Fig 5.** Excel screenshot of the CoD (left) and DB (right) calculation for a man aged 20, with a score of 80 and life expectancy of 63 years. Source: own elaboration.

To calculate the CoD we replicate the same idea as in LoE, knowing that in this case the annual amount paid by the user will be 42.6% of the total estimated cost for Grade 3, which ensures a place in a public nursing home (€8,020,13) (IMSERSO, 2020). This amount will be paid every year until the age of 83. As Fig. 5 shows, the total CoD for this individual is €502,273.39.

To calculate the DB, we first determine the annual estimated benefit, by adding the 12 payments of €531 from the great dependency aid and the 14 payments of €1,205.37 from the absolute permanent disability pension. Then, we apply the survival probabilities to this amount, which the disabled will receive until the age of 83. As Fig. 5 shows, the total DB for this individual is €1,455,891.62.

Finally, according to the man's age and the dependence score assigned, the SC the individual will receive is €256,859.27 (DGSFP, 2020).

Therefore, the LoEC is:

$$\text{LoEC} = 1{,}361{,}591.25 + 502{,}273.39 - 1{,}455{,}891.62 - 256{,}859.27 = €151{,}113.76$$

We have replicated this calculation for two individuals of each age group (man and woman[15]) that we have considered throughout this study. The results are shown in Table 8. We observe how LoEC is notably lower in ages from 50 onwards, even reaching negative values, implying the disabled would economically benefit from the RTI-dependence and Grade 3 dependence. This is plausible, given that we are assuming the RTI-dependence starts in the exact moment of the valuation, which results in a much higher SC proportion relative to LoE and CoD than in the younger scenarios. In reality, as we have seen, most disabilities attributable to RTIs are acquired at young ages (25-44), hence the existence of a cumulative effect on the older population. Thus, even if many elder are disabled due to RTIs, they will not receive a SC in the present (they already received it in the past), hence it shouldn't be taken into consideration for the LoEC. In fact, it's simple to see that if we ignore the SC from the age of 50 onwards, we obtain LoEC>0.

We find that LoEC is over €100,000 on average for the younger part of the population with RTI-dependence. That is to say, even after receiving the disability benefits and aids provided by the Spanish government, RTI-dependent people incur an estimated loss of over €100,000 throughout their lifetime. This finding emphasizes the need for the existing Spanish legislation governing the provision of care for dependents in addition to road safety policies, and suggests the need for its periodic revision, especially with regard to the young population.

[15] Note that the SC is the same for both sexes, given that we don't need to apply survival probabilities to it, and the Spanish law assigns the compensation solely based on the disabled's age and sequelae score.

**Table 8**
2020 estimated Loss of Earnings Compensation for Grade 3 when the disability is attributable to RTIs (in euros).

| Age | Sex | Score | LoE | CoD | DB | SC | LoEC |
|---|---|---|---|---|---|---|---|
| 20 | M | 80 | 1,361,591.25 | 502,273.39 | 1,455,891.62 | 256,859.27 | 151,113.76 |
| 20 | F | 80 | 1,373,373.72 | 507,450.20 | 1,470,897.11 | 256,859.27 | 153,067.54 |
| 30 | M | 80 | 1,200,164.54 | 419,865.33 | 1,217,023.29 | 246,942.77 | 156,063.81 |
| 30 | F | 80 | 1,214,225.90 | 426,068.83 | 1,235,004.78 | 246,942.77 | 158,347.18 |
| 40 | M | 80 | 969,982.91 | 337,221.61 | 977,471.87 | 237,026.27 | 92,706.38 |
| 40 | F | 80 | 986,800.98 | 344,675.31 | 999,077.20 | 237,026.27 | 95,372.82 |
| 50 | M | 80 | 714,024.25 | 262,031.88 | 759,526.63 | 223,805.93 | -7,276.43 |
| 50 | F | 80 | 734,195.05 | 271,218.58 | 786,155.22 | 223,805.93 | -4,547.52 |
| 60 | M | 80 | 450,025.36 | 189,627.52 | 549,655.07 | 208,105.39 | -118,107.58 |
| 60 | F | 80 | 469,054.54 | 198,813.71 | 576,282.19 | 208,105.39 | -116,519.34 |
| 70 | M | 80 | 244,882.56 | 120,747.97 | 350,000.55 | 189,029.61 | -173,399.63 |
| 70 | F | 80 | 258,784.08 | 127,602.61 | 369,869.43 | 189,029.61 | -172,512.34 |
| 80 | M | 80 | 134,213.02 | 66,178.46 | 191,825.13 | 169,058.77 | -160,492.43 |
| 80 | F | 80 | 144,914.70 | 71,455.30 | 207,120.60 | 169,058.77 | -159,809.38 |
| 90 | M | 80 | 65,443.14 | 32,269.05 | 93,535.19 | 149,087.94 | -144,910.94 |
| 90 | F | 80 | 69,177.38 | 34,110.34 | 98,872.37 | 149,087.94 | -144,672.59 |

Source: own elaboration.

Moreover, we find that our results are higher than the LoEC considered on the Spanish Traffic Indemnity Scale (Table 2.C.4). We need to recall that the Traffic Indemnity Scale does not consider the SC in the calculation of the LoEC, so we should only compare it with our LoEC excluding the SC (among younger population, the difference exists even if we include the SC). For instance, according to the Spanish law, a 20 year old disabled individual who cannot perform any profession and has a net income lower than €15,000 per year (average salary: €12,925.08 from 20 to 24 years old (INE, 2022a)), should receive a LoEC of €60,774. According to our calculation the LoEC should be €151,113.76 (for a man[16]) and if we exclude the SC, this compensation would increase to €407,973.03. This difference can also be seen among the older population, even if it isn't as prominent. For instance, according to the Spanish law, a 60 year old disabled individual who cannot perform any profession and has a net income lower than €30,000 per year (average salary: €27,390.57 from 60 to 64 years old (INE, 2022a)), should receive a LoEC of €8,487. According to our calculation, the LoEC should be €-118,107.58 (for a man) but if we exclude the SC, this compensation would increase to €89,997.81.

Furthermore, the Traffic Indemnity Scale assigns the same LoEC (according to net income) to all individuals aged over 65, but applying life expectancies, we observe through our calculations that they should receive different LoEC according to age when they have the same level of net income. We show this results in Table 9.

[16] Note that Table 2.C.4 from the Traffic Indemnity Scale does not differentiate by sex, which implies a lower compensation for women, who have a higher life expectancy.

**Table 9**
Comparison of LoEC according to the Spanish Traffic Indemnity Scale and according to our estimation (for men only) (in euros).

| Age | Score | Average net income | Law LoEC | LoEC (excluding SC) |
|---|---|---|---|---|
| 20 | 80 | 12,925.08 | 60,774 | 407,973.03 |
| 30 | 80 | 21,321.13 | 71,131 | 403,006.58 |
| 40 | 80 | 26,125.41 | 53,417 | 329,732.65 |
| 50 | 80 | 27,754.07 | 31,675 | 216,529.50 |
| 60 | 80 | 27,390.57 | 8,487 | 89,997.81 |
| 70 | 80 | 16,265.2 | 815 | 15,629.98 |
| 80 | 80 | 16,265.2 | 815 | 8,566.34 |
| 90 | 80 | 16,265.2 | 815 | 4,177.00 |

Source: own elaboration.

## 4. Conclusion

In this study, we have seen how the Spanish benefits system takes into account the difficulties that an individual face when undertaking basic daily activities - which we used to identify 21 different impairments (listed in Table 1) - and their need for help to conduct them. The severity of the disability and the amount of help needed is determined by a scale. However, current assessments don't take into account the cause of the disability, even though we believe it to be relevant for public policies, such as provisioning third person support to the disabled.

We have also mentioned the absence of information regarding the dependence attributable to RTIs and its long term costs, a rarely discussed topic, perhaps due to its inherent complexity (Alghnam et al., 2015; Babaie et al., 2023; Haider et al., 2020). Only topics like mortality rates, direct and indirect short-term costs and type of injuries related to road traffic accidents are widely addressed (Banstola et al., 2020; Jaramillo et al., 2016; Kruse, 2015; van der Vlegel et al., 2020; Wan et al., 2023; Weijermars et al., 2018; Xu et al., 2022; Zakeri et al., 2021).

Relying on the EDAD 2020 survey, we have estimated the prevalence of dependency among disabled individuals, essential to calculate requirements to guarantee sufficient public coverage. Our results show that prevalence rates attributable to RTIs are 0.24% (10.63% other causes and 10.86% all causes), which equates to around 92,000 individuals with long-term care needs attributable to RTIs in 2020.

Analyzing the prevalence of the impairments, we have concluded that RTIs impact most frequently to the victim's mobility. According to our estimations, over 60% of these individuals have major difficulties moving outside of their home without help, and over 50% have difficulties keeping their body in the same position or changing positions without help. Moreover, all the impairments pertaining to the categories Mobility, Self-care and IADL (Domestic life), present higher prevalence rates than when we consider all causes.

We have also studied RTI-dependence prevalence rates by age intervals, clearly seeing how they have increased for every age group from the age of 35 compared to the last

survey (EDAD 2008). Nonetheless, the same cannot be said when considering other causes, since prevalence rates increase for some age groups and decrease for others. Overall, there seems to be a general increase of prevalence of dependence compared to 2008 (when considering the total prevalence rate). This rise is equally noticeable in the number of dependents.

Furthermore, we have analyzed RTI-dependence according to the four degrees of dependence, comparing the distribution to that of the dependence attributable to other causes. It is remarkable how in all age groups, the percentage of individuals with disabilities attributable to RTIs but with no LTC needs (Grade 0) is lower than the equivalent figures for individuals with disabilities attributable to causes other than RTIs. This result translates into saying that the percentage of individuals with disabilities attributable to RTIs with LTC needs (Grade 1, 2 and 3) is higher than the equivalent figures for individuals with disabilities attributable to causes other than RTIs in all age groups. Moreover, we have also seen how the prevalence of Grade 3 is higher when the disability is attributable to RTIs in all age groups except 25-34. In line with this, we have seen that there is an increase in the severity of dependence with age, regardless of the cause of the disabilities, but this increase starts at an earlier age and is notably higher when the disabilities are attributable to RTIs. When considering causes other than RTIs, the percentage of Grade 3 goes from 9.02% in the 65-74 age group to 15.27% in the 75-84 age group, but when only considering RTIs, the percentage of Grade 3 goes from 6.54% in the 55-64 age group to 26.92% in the 65-74 age group.

Considering the estimations of the annual costs we presented in section 3.2 for each grade, we have also estimated the RTIs long-term care costs to be around 870 million euros in 2020, which represent 2.94% of the total annual cost of the estimated LTC needs for the adult population in Spain and 0.08% of its 2020 GDP. This same values where estimated to be 2.08% and 0.04% respectively with the EDAD 2008 survey (Alemany et al., 2013). This results highlight how RTIs hold great significance and have continued to increase their incidence in recent years (Wan et al., 2023). Over half of this RTIs LTC costs amount correspond to people between the ages of 35 and 64, but if we examine the proportion these costs constitute in relation to the total in every age group (LTC costs attributable to any cause), we observe that the age groups with the highest relative weight of RTIs LTC costs are 35-44 and 45-54, reaching 13.21% and 10.68% of the total LTC costs in the 35-44 age group and the 45-54 age group, respectively. On the other hand, even though the costs attributable to RTIs are higher than in the 35-44 age group, they only represent 4.42% of the total LTC costs in the 55-64 age group. This clearly demonstrates the higher incidence of RTIs among the younger population. In fact, this can also be observed in the proportion these costs represent in terms of the Spanish GDP. When considering LTC costs attributable to any cause, the proportions seem to increase almost exponentially with age. However, when only considering RTIs, proportions are considerably lower among the older population (not over 0.09% over the age of 65) and it is in the range of 35 to 64 years old where we find the highest values (reaching 0.023% in the 45-54 age group).

We find it relevant to recall that, to carry out this estimation, we assumed every individual with the same grade of dependence needs the same type and amount of help. Moreover, we assigned specific services provided to dependents according to previous studies (Albarrán et al., 2005; Alemany et al., 2013; Artís et al., 2007). This can lead to an overestimation of the total costs, as seen in other studies' results of the actual average costs for Grade 2 and Grade 3 in Spain (Del Pozo & Escribano, 2013). Calculating this

average for Grade 1 and revising the total LTC costs with the new scenario seem great future lines of research.

Furthermore, the costs we estimated are for formal LTC services, but in Spain most dependents receive informal long-term care services, such as uncompensated help from a family member (Artís et al., 2007). This can also lead to an overestimation of the total LTC costs. Thus, a big part of the costs we estimated should not be considered, since these services are not actually remunerated. However, an actual personal cost exists for the caregivers, who often have to reduce their working hours to take care of their loved ones. Moreover, this cost could actually be estimated from an actuarial perspective. This rises an interesting future line of research, where we could estimate the cost associated to both formal and informal LTC services in Spain.

On the other hand, in our estimation we have only considered the adult Spanish population because identifying chronic or permanent dependence in younger individuals is difficult. However, even if this dependence is complex to identify and evaluate from a long-term perspective, its cost is not nonexistent, which leads to an underestimation of the LTC costs.

In the last part of our study, we have analyzed the benefits and aids the Spanish legislation provides for the disabled and dependents in addition to the economic compensation for the injuries attributable to a road traffic accident, allowing us to estimate the life-long losses a Grade 3 RTI-dependent incurs. We called this losses Loss of Earnings Compensation (LoEC), as it corresponds to the economic amount the Grade 3 RTI-dependents should receive as a compensation to place them in a position as close as possible to the one they would have had if the accident had not occurred. We found that the average of LoEC is over €100,000 for dependents between the ages of 20 and 40. This result emphasizes the need for a legislation such as the existing one, governing the provision of care for dependents in addition to road safety policies, and suggests the need for its periodic revision, especially with regard to the young population.

For people over 50, LoEC reaches negative values, implying the Grade 3 RTI-dependent would economically benefit from their disability. This result occurs because we assumed the road traffic accident happens at the same time as the valuation, meaning the victim receives a compensation for the injuries and sequelae caused by the accident. Since life expectancy decreases with age, the proportion of the compensation in relation to the life-long costs and loss of earnings the victim incurs is notably higher among the older population, which translates into obtaining more profit than losses. However, it's important to recall that RTI-dependence has a cumulative effect, since it is usually acquired at young ages (25-44). Therefore, in most cases, the sequelae compensation (SC) will not be received so late in life.

In line with our results, we want to mention the recent approval of the Automobile Insurance Bill (Proyecto de Ley de Seguros de Automóviles, por el que se modifica la normativa legal y reglamentaria relativa a la responsabilidad civil y seguro en la circulación de vehículos a motor (Ministerio De Justicia, 2024)) which aims to improve coverage, compensation, and safety for accident victims (Ministerio de Economía, Comercio y Empresa, 2024). The Spanish Ministry of Justice aims to expand the vehicles (such as electric scooters) required to have liability insurance. Moreover, it wants to consider the conclusions and recommendations published on the Reasoned Report provided for in additional provision one of Law 35/2015 by the Monitoring Commission

of the Bodily Injury Assessment System (Comisión de Seguimiento del Sistema de Valoración & de Daño Corporal de la Ley 35/2015, 2020). This report studies the implications and deficiencies of the latest reform of the System for the valuation of damages and harm caused to people in traffic accidents[17] (Law 35/2015, of September 22nd).

Among other things, the report highlights the need for a revision of the Loss of Earnings Compensation (Lucro Cesante) and the actuarial calculation of the economic compensation for the need for assistance from a third person according to the daily hours assigned (Table 2.C.3). Moreover, it highlights how the Spanish public dependence benefits are hard to estimate due to their heterogeneity across Autonomous Communities, and the frequent scenario where this benefit is not actually received. This report suggests that the calculation of the compensation for the need for assistance from a third person should be done discounting the public benefit only in those cases where it is actually received.

Overall, considering the recommendations published in the report, would generally entail a higher compensation for RTI-dependents, especially for severe and fully dependent individuals. This aligns with the results we obtained in Section 3.3, where we observed significant differences between our LoEC estimation and the LoEC available on the latest reform of the Traffic Indemnity Scale, implying the compensation for RTI-dependents should be higher.

Finally we want to address other limitations our study has. Everything we mention, should be carefully considered for future studies and lines of research in this field.

As we previously mentioned, the EDAD 2020 survey's questions were not the same as the EDAD 2008, which made it difficult to accurately compare the results from both surveys. Moreover, when we calculated the dependence score, the questions in the survey asked to individuals with limitations did not align with the 10 categories that the Spanish law considers to do so. For some categories we only had one question related to it, when in reality, every category has subcategories with various limitations related to it. This means, in some cases we assigned the whole score of a category when we only had data from some of the subcategories.

Furthermore, when we identified RTI-dependence, we only had data relating to the cause of each of the 8 categories of functional and sensory limitations, and not the cause for every type of impairment we identified. Moreover, we said an individual is RTI-dependent when any of the 8 categories can be presented as a consequence of a traffic accident, but they could also have another category of limitations as a consequence of another cause. For instance, an individual we considered RTI-dependent could also be considered dependent as a consequence of a leisure accident (Ayuso et al., 2023).

Finally, to estimate the LoEC, we used regular life expectancies in all cases, since we did not have the survival probabilities of dependent individuals. When calculating the disability benefits they will receive throughout their life, we should consider that disabled individuals have a lower life expectancy, hence we should expect lower benefits and, consequently, a higher LoEC than the one we have estimated.

[17] (Ley 35/2015, de 22 de septiembre, de reforma del sistema para la valoración de los daños y perjuicios causados a las personas en accidentes de circulación, 2015) Recall that we called this the Traffic Indemnity Scale in Section 3.3.

# 5. Annexes

## Annex 1

Excel calculations of the annual 2020 LTC costs in Spain.

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | total población todas las causas | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | frecuencia | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 y más | TOTAL |
| 7 | | | | | | | | | | |
| 8 | GRADO 0 | 51246 | 78023 | 156863 | 337260 | 467931 | 502357 | 518624 | 315994 | 2428299 |
| 9 | GRADO 1 | 4434 | 14218 | 37737 | 83682 | 122952 | 138251 | 222355 | 169806 | 793434 |
| 10 | GRADO 2 | 8420 | 6461 | 14376 | 26116 | 43116 | 44302 | 103932 | 120860 | 367585 |
| 11 | GRADO 3 | 10779 | 12293 | 12737 | 33274 | 42627 | 70123 | 153523 | 267915 | 603271 |
| 12 | TOTAL | 74879 | 110995 | 221714 | 480332 | 676627 | 755032 | 998434 | 874575 | 4192589 |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | baremo (Causa tráfico) | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | frecuencia | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 y más | TOTAL |
| 19 | | | | | | | | | | |
| 20 | GRADO 0 | 0 | 3059.935 | 6064.153 | 10551.964 | 10856.82 | 5916.814 | 3147.111 | 363.646 | 39960 |
| 21 | GRADO 1 | 0 | 264.905 | 5441.774 | 7384.235 | 5533.001 | 1581.297 | 2406.173 | 686.977 | 23298 |
| 22 | GRADO 2 | 0 | 1170.391 | 1075.475 | 2934.764 | 2522.112 | 671.622 | 1281.436 | 500.788 | 10157 |
| 23 | GRADO 3 | 685.741 | 416.377 | 1916.55 | 4791.893 | 1323.575 | 3009.912 | 2474.756 | 3644.52 | 18263 |
| 24 | TOTAL | 686 | 4912 | 14498 | 25663 | 20236 | 11180 | 9309 | 5196 | 91679 |
| 25 | | | | | | | | | | |
| 26 | baremo (otras causas) | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | frecuencia | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 y más | TOTAL |
| 29 | | | | | | | | | | |
| 30 | GRADO 0 | 51246 | 74963 | 150799 | 326708 | 457075 | 496440 | 515477 | 315631 | 2388338 |
| 31 | GRADO 1 | 4434 | 13953 | 32295 | 76298 | 117419 | 136669 | 219949 | 169119 | 770135 |
| 32 | GRADO 2 | 8420 | 5291 | 13301 | 23182 | 40594 | 43630 | 102651 | 120359 | 357428 |
| 33 | GRADO 3 | 10093 | 11877 | 10821 | 28482 | 41304 | 67113 | 151048 | 264270 | 585008 |
| 34 | TOTAL | 74193 | 106083 | 207216 | 454669 | 656391 | 743853 | 989125 | 869379 | 4100910 |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | TOTAL TODAS CAUSAS | 74879 | 110995 | 221714 | 480332 | 676627 | 755032 | 998434 | 874575 | 4192589 |
| 38 | % grado 0/total | 68.44% | 70.29% | 70.75% | 70.21% | 69.16% | 66.53% | 51.94% | 36.13% | |
| 39 | % grado 1/total | 5.92% | 12.81% | 17.02% | 17.42% | 18.17% | 18.31% | 22.27% | 19.42% | |
| 40 | % grado 2/ total | 11.24% | 5.82% | 6.48% | 5.44% | 6.37% | 5.87% | 10.41% | 13.82% | |
| 41 | % grado 3/ total | 14.40% | 11.08% | 5.74% | 6.93% | 6.30% | 9.29% | 15.38% | 30.63% | |
| 42 | | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | TOTAL CAUSA TRÁFICO | 686 | 4912 | 14498 | 25663 | 20236 | 11180 | 9309 | 5196 | |
| 46 | % grado 0/total causa tráfico | 0.00% | 62.30% | 41.83% | 41.12% | 53.65% | 52.92% | 33.81% | 7.00% | |
| 47 | % grado 1/total causa tráfico | 0.00% | 5.39% | 37.53% | 28.77% | 27.34% | 14.14% | 25.85% | 13.22% | |
| 48 | % grado 2/ total causa tráfico | 0.00% | 23.83% | 7.42% | 11.44% | 12.46% | 6.01% | 13.76% | 9.64% | |
| 49 | % grado 3/ total causa tráfico | 100.00% | 8.48% | 13.22% | 18.67% | 6.54% | 26.92% | 26.58% | 70.14% | |
| 50 | | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | |
| 51 | | | | | | | | | | |
| 52 | TOTAL OTRAS CAUSAS | 74193 | 106083 | 207216 | 454669 | 656391 | 743853 | 989125 | 869379 | |
| 53 | % grado 0/total otras causas | 69.07% | 70.66% | 72.77% | 71.86% | 69.63% | 66.74% | 52.11% | 36.31% | |
| 54 | % grado 1/total otras causas | 5.98% | 13.15% | 15.59% | 16.78% | 17.89% | 18.37% | 22.24% | 19.45% | |
| 55 | % grado 2/ total otras causas | 11.35% | 4.99% | 6.42% | 5.10% | 6.18% | 5.87% | 10.38% | 13.84% | |
| 56 | % grado 3/ total otras causas | 13.60% | 11.20% | 5.22% | 6.26% | 6.29% | 9.02% | 15.27% | 30.40% | |
| 57 | | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | |
| 58 | | | | | | | | | | |
| 59 | Costes en un año por dependencia: coste total de la dependencia asociada a accidentes de tráfico | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | TOTAL TODAS CAUSAS | | | | | | | | | |
| 63 | | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 y más | TOTAL |
| 64 | 16293.6 | 72244893.66 | 231654290.6 | 614871697.3 | 1363483707 | 2003325314 | 2252602893 | 3622960349 | 2766750748 | |
| 65 | 14347.72 | 120806755 | 92703273.25 | 206267858.8 | 374711024.2 | 618621647.2 | 635630854.9 | 1491193978 | 1734064636 | |
| 66 | 18,839.62 | 203072678.5 | 231603945.3 | 239961690.6 | 626868215.9 | 803079571.4 | 1321085624 | 2892318806 | 5047415059 | |
| 67 | coste en euros/anual | 396124327.1 | 555961509.2 | 1061101247 | 2365062947 | 3425026533 | 4209319372 | 8006473133 | 9548230443 | |
| 68 | | | | | | | | | | |
| 69 | | | | | | | | | | |
| 70 | TOTAL CAUSA TRÁFICO | | | | | | | | | |
| 71 | 16293.6 | 0 | 4316256.108 | 88666088.85 | 120315771.4 | 90152505.09 | 25765020.8 | 39205220.39 | 11193328.45 | |
| 72 | 14347.72 | 0 | 16792442.36 | 15430614.17 | 42107172.14 | 36186556.78 | 9636244.402 | 18385684.93 | 7185166.003 | |
| 73 | 18839.62 | 12919099.86 | 7844384.457 | 36107073.71 | 90277443.2 | 24935650.04 | 56705598.31 | 46623462.63 | 6866137.188 | |
| 74 | coste en euros/anual | 12919099.86 | 28953082.92 | 140203776.7 | 252700386.7 | 151274711.9 | 92106863.51 | 104214368 | 87039866.33 | |
| 75 | | | | | | | | | | |
| 76 | TOTAL OTRAS CAUSAS | | | | | | | | | |
| 77 | 16293.6 | 72244893.66 | 227338034.5 | 526205608.4 | 1243167936 | 1913172809 | 2226837872 | 3583755128 | 2755557420 | |
| 78 | 14347.72 | 120806755 | 75910830.89 | 190837244.6 | 332603852 | 582435090.4 | 625994610.5 | 1472808294 | 1726879470 | |
| 79 | 18839.62 | 190153578.6 | 223759560.9 | 203854616.9 | 536590772.7 | 778143921.4 | 1264380026 | 2845695343 | 4978753687 | |
| 80 | coste en euros/anual | 383205227.3 | 527008426.2 | 920897469.9 | 2112362561 | 3273751821 | 4117212508 | 7902258765 | 9461190577 | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | 1000000 | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 84 | | | | | | | | | | | |
| 85 | Costes en un año por dependencia: coste total de la dependencia asociada a accidentes de tráfico | | | | | | | | | | |
| 86 | TOTAL TODAS CAUSAS | | | | | | | | | | |
| 87 | | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 y más | TOTAL | |
| 88 | 16293.6 | 72.24 | 231.65 | 614.87 | 1363.48 | 2003.33 | 2252.60 | 3622.96 | 2766.75 | 12927.89 | GRADO 1 |
| 89 | 14347.72 | 120.81 | 92.70 | 206.27 | 374.71 | 618.62 | 635.63 | 1491.19 | 1734.06 | 5274.00 | GRADO 2 |
| 90 | 18839.62 | 203.07 | 231.60 | 239.96 | 626.87 | 803.08 | 1321.09 | 2892.32 | 5047.42 | 11365.41 | GRADO 3 |
| 91 | coste en euros/anual | 396.12 | 555.96 | 1061.10 | 2365.06 | 3425.03 | 4209.32 | 8006.47 | 9548.23 | 29567.30 | TOTAL |
| 92 | porcentaje sobre el PIB | 0.035% | 0.050% | 0.095% | 0.212% | 0.306% | 0.377% | 0.716% | 0.854% | 2.645% | |
| 93 | | | | | | | | | | | |
| 94 | TOTAL CAUSA TRÁFICO | | | | | | | | | | |
| 95 | | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85 y más | TOTAL | |
| 96 | 16293.6 | 0.00 | 4.32 | 88.67 | 120.32 | 90.15 | 25.77 | 39.21 | 11.19 | 379.61 | GRADO 1 |
| 97 | 14347.72 | 0.00 | 16.79 | 15.43 | 42.11 | 36.19 | 9.64 | 18.39 | 7.19 | 145.72 | GRADO 2 |
| 98 | 18839.62 | 12.92 | 7.84 | 36.11 | 90.28 | 24.94 | 56.71 | 46.62 | 68.66 | 344.07 | GRADO 3 |
| 99 | coste en euros/anual | 12.92 | 28.95 | 140.20 | 252.70 | 151.27 | 92.11 | 104.21 | 87.04 | 869.41 | TOTAL |
| 100 | porcentaje sobre el PIB | 0.001% | 0.003% | 0.013% | 0.023% | 0.014% | 0.008% | 0.009% | 0.008% | 0.078% | |
| 101 | | | | | | | | | | | |
| 102 | TOTAL OTRAS CAUSAS | | | | | | | | | | |
| 103 | 16293.6 | 72.24 | 227.34 | 526.21 | 1243.17 | 1913.17 | 2226.84 | 3583.76 | 2755.56 | 12548.28 | GRADO 1 |
| 104 | 14347.72 | 120.81 | 75.91 | 190.84 | 332.60 | 582.44 | 625.99 | 1472.81 | 1726.88 | 5128.28 | GRADO 2 |
| 105 | 18839.62 | 190.15 | 223.76 | 203.85 | 536.59 | 778.14 | 1264.38 | 2845.70 | 4978.75 | 11021.33 | GRADO 3 |
| 106 | coste en euros/anual | 383.21 | 527.01 | 920.90 | 2112.36 | 3273.75 | 4117.21 | 7902.26 | 9461.19 | 28697.89 | TOTAL |
| 107 | porcentaje sobre el PIB | 0.034% | 0.047% | 0.082% | 0.189% | 0.293% | 0.368% | 0.707% | 0.846% | 2.567% | |
| 108 | | | | | | | | | | | |
| 109 | | | | | | | | | | | |
| 110 | **Tráfico** | | | | | | | | | | |
| 111 | % COSTE TRÁFICO/COSTE TOTAL | 3.26% | 5.21% | 13.21% | 10.68% | 4.42% | 2.19% | 1.30% | 0.91% | 2.94% | |
| 112 | % COSTE TRÁFICO/COSTE GRADO 1/COSTE TOTAL GRADO 1 | 0.00% | 1.86% | 14.42% | 8.82% | 4.50% | 1.14% | 1.08% | 0.40% | 2.94% | |
| 113 | % COSTE TRÁFICO/COSTE GRADO 2/COSTE TOTAL GRADO 2 | 0.00% | 18.11% | 7.48% | 11.24% | 5.85% | 1.52% | 1.23% | 0.41% | 2.76% | |
| 114 | % COSTE TRÁFICO/COSTE GRADO 3/COSTE TOTAL GRADO 3 | 6.36% | 3.39% | 15.05% | 14.40% | 3.11% | 4.29% | 1.61% | 1.36% | 3.03% | |
| 115 | | | | | | | | | | | |
| 116 | PIB 2020 | 1117989 | | | | | | | | | |
| 117 | total causa tráfico | 0.000777657 | | | | | | | | | |

## Annex 2

Excel calculations for the LoEC for a woman aged 20 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 1094602.8 | 292773.6 | | | 1089217.9 | 284155.8222 | 1373373.722 |
| 3 | 20 | 12925.08 | | 995271.2082 | 1 | 12925.08 | 0 | |
| 4 | 21 | 12925.08 | | 995195.0733 | 0.999923503 | 12924.09128 | 0 | |
| 5 | 22 | 12925.08 | | 995119.0444 | 0.999847113 | 12923.10393 | 0 | |
| 6 | 23 | 12925.08 | | 995043.8733 | 0.999771585 | 12922.12772 | 0 | |
| 7 | 24 | 12925.08 | | 994970.2456 | 0.999697607 | 12921.17155 | 0 | |
| 8 | 25 | 18372.47 | | 994897.6135 | 0.99962463 | 18365.57353 | 0 | |
| 9 | 26 | 18372.47 | | 994826.0241 | 0.999552701 | 18364.25201 | 0 | |
| 10 | 27 | 18372.47 | | 994754.9594 | 0.999481298 | 18362.94017 | 0 | |
| 11 | 28 | 18372.47 | | 994683.9337 | 0.999409935 | 18361.62905 | 0 | |
| 12 | 29 | 18372.47 | | 994612.0017 | 0.999337661 | 18360.3012 | 0 | |
| 13 | 30 | 21321.13 | | 994538.7887 | 0.999264101 | 21305.43979 | 0 | |
| 14 | 31 | 21321.13 | | 994463.4895 | 0.999188444 | 21303.8267 | 0 | |
| 15 | 32 | 21321.13 | | 994385.3583 | 0.999109941 | 21302.15294 | 0 | |
| 16 | 33 | 21321.13 | | 994304.102 | 0.999028299 | 21300.41223 | 0 | |
| 17 | 34 | 21321.13 | | 994218.5248 | 0.998942315 | 21298.57896 | 0 | |
| 18 | 35 | 23671.27 | | 994127.404 | 0.998850761 | 23644.06606 | 0 | |
| 19 | 36 | 23671.27 | | 994029.0611 | 0.998751951 | 23641.7271 | 0 | |
| 20 | 37 | 23671.27 | | 993921.7832 | 0.998644164 | 23639.17563 | 0 | |
| 21 | 38 | 23671.27 | | 993803.847 | 0.998525667 | 23636.37066 | 0 | |
| 22 | 39 | 23671.27 | | 993673.1917 | 0.998394391 | 23633.26319 | 0 | |
| 23 | 40 | 26125.41 | | 993528.2657 | 0.998248776 | 26079.65856 | 0 | |
| 24 | 41 | 26125.41 | | 993367.3143 | 0.99808706 | 26075.43366 | 0 | |
| 25 | 42 | 26125.41 | | 993188.7709 | 0.997907669 | 26070.74698 | 0 | |
| 26 | 43 | 26125.41 | | 992990.433 | 0.997708388 | 26065.5407 | 0 | |
| 27 | 44 | 26125.41 | | 992770.0581 | 0.997486966 | 26059.75596 | 0 | |
| 28 | 45 | 27279.93 | | 992525.4975 | 0.997241244 | 27204.67132 | 0 | |
| 29 | 46 | 27279.93 | | 992253.3463 | 0.9969678 | 27197.21178 | 0 | |
| 30 | 47 | 27279.93 | | 991950.2217 | 0.996663235 | 27188.90327 | 0 | |
| 31 | 48 | 27279.93 | | 991611.9494 | 0.996323355 | 27179.63138 | 0 | |
| 32 | 49 | 27279.93 | | 991232.9038 | 0.995942509 | 27169.24192 | 0 | |
| 33 | 50 | 27754.07 | | 990807.7509 | 0.995515336 | 27629.60231 | 0 | |
| 34 | 51 | 27754.07 | | 990331.2032 | 0.995036524 | 27616.31333 | 0 | |
| 35 | 52 | 27754.07 | | 989798.6958 | 0.994501486 | 27601.46387 | 0 | |
| 36 | 53 | 27754.07 | | 989207.9687 | 0.993907952 | 27584.99089 | 0 | |
| 37 | 54 | 27754.07 | | 988558.592 | 0.99325549 | 27566.88241 | 0 | |
| 38 | 55 | 28713.98 | | 987853.5739 | 0.992547123 | 28499.97823 | 0 | |
| 39 | 56 | 28713.98 | | 987098.8809 | 0.991788844 | 28478.20503 | 0 | |
| 40 | 57 | 28713.98 | | 986302.4301 | 0.990988609 | 28455.2271 | 0 | |
| 41 | 58 | 28713.98 | | 985473.9569 | 0.990156199 | 28431.32531 | 0 | |
| 42 | 59 | 28713.98 | | 984623.9601 | 0.989302164 | 28406.80255 | 0 | |
| 43 | 60 | 27390.57 | | 983762.1063 | 0.988436215 | 27073.83135 | 0 | |
| 44 | 61 | 27390.57 | | 982897.2152 | 0.987567215 | 27050.02893 | 0 | |
| 45 | 62 | 27390.57 | | 982070.0993 | 0.986736169 | 27027.26612 | 0 | |
| 46 | 63 | 27390.57 | | 981135.4087 | 0.985797038 | 27001.54276 | 0 | |
| 47 | 64 | 27390.57 | | 980109.1266 | 0.984765879 | 26973.29876 | 0 | |
| 48 | 65 | 26833.25 | | 979018.3821 | 0.983669953 | 26395.06175 | 0 | |
| 49 | 66 | 0 | 16265.2 | 977897.2896 | 0.982543533 | 0 | 15981.26708 | |
| 50 | 67 | 0 | 16265.2 | 976773.0433 | 0.981413946 | 0 | 15962.89411 | |
| 51 | 68 | 0 | 16265.2 | 975651.7458 | 0.98028732 | 0 | 15944.56932 | |
| 52 | 69 | 0 | 16265.2 | 974530.1844 | 0.97916043 | 0 | 15926.24023 | |
| 53 | 70 | 0 | 16265.2 | 973402.6265 | 0.978027515 | 0 | 15907.81314 | |
| 54 | 71 | 0 | 16265.2 | 972253.5459 | 0.976872975 | 0 | 15889.03431 | |
| 55 | 72 | 0 | 16265.2 | 971075.3318 | 0.975689163 | 0 | 15869.77937 | |
| 56 | 73 | 0 | 16265.2 | 969863.1266 | 0.974471198 | 0 | 15849.96893 | |
| 57 | 74 | 0 | 16265.2 | 968579.4086 | 0.973181381 | 0 | 15828.98979 | |
| 58 | 75 | 0 | 16265.2 | 967202.9455 | 0.971798378 | 0 | 15806.49497 | |
| 59 | 76 | 0 | 16265.2 | 965701.1545 | 0.970289451 | 0 | 15781.95198 | |
| 60 | 77 | 0 | 16265.2 | 964032.1491 | 0.968612516 | 0 | 15754.6763 | |
| 61 | 78 | 0 | 16265.2 | 962128.8918 | 0.966700216 | 0 | 15723.57235 | |
| 62 | 79 | 0 | 16265.2 | 959933.3582 | 0.964494251 | 0 | 15687.69189 | |
| 63 | 80 | 0 | 16265.2 | 957362.2627 | 0.961910939 | 0 | 15645.67381 | |
| 64 | 81 | 0 | 16265.2 | 954306.2755 | 0.958840432 | 0 | 15595.7314 | |
| 65 | 82 | 0 | 16265.2 | 950655.4515 | 0.955172262 | 0 | 15536.06788 | |
| 66 | 83 | 0 | 16265.2 | 946209.2119 | 0.950704897 | 0 | 15463.4053 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 1470897.109 | 507450.1953 |
| 3 | 20 | 995271.2082 | 1 | 23247.18 | 8020.13 |
| 4 | 21 | 995195.0733 | 0.999923503 | 23245.40167 | 8019.516487 |
| 5 | 22 | 995119.0444 | 0.999847113 | 23243.62581 | 8018.903828 |
| 6 | 23 | 995043.8733 | 0.999771585 | 23241.87 | 8018.298082 |
| 7 | 24 | 994970.2456 | 0.999697607 | 23240.15023 | 8017.704772 |
| 8 | 25 | 994897.6135 | 0.99962463 | 23238.45371 | 8017.119486 |
| 9 | 26 | 994826.0241 | 0.999552701 | 23236.78155 | 8016.542602 |
| 10 | 27 | 994754.9594 | 0.999481298 | 23235.12165 | 8015.969946 |
| 11 | 28 | 994683.9337 | 0.999409935 | 23233.46266 | 8015.397604 |
| 12 | 29 | 994612.0017 | 0.999337661 | 23231.7825 | 8014.817959 |
| 13 | 30 | 994538.7887 | 0.999264101 | 23230.07241 | 8014.227991 |
| 14 | 31 | 994463.4895 | 0.999188444 | 23228.3136 | 8013.621213 |
| 15 | 32 | 994385.3583 | 0.999109941 | 23226.48864 | 8012.991613 |
| 16 | 33 | 994304.102 | 0.999028299 | 23224.59069 | 8012.33683 |
| 17 | 34 | 994218.5248 | 0.998942315 | 23222.59181 | 8011.647229 |
| 18 | 35 | 994127.404 | 0.998850761 | 23220.46344 | 8010.912956 |
| 19 | 36 | 994029.0611 | 0.998751951 | 23218.16638 | 8010.120486 |
| 20 | 37 | 993921.7832 | 0.998644164 | 23215.66063 | 8009.256015 |
| 21 | 38 | 993803.847 | 0.998525667 | 23212.90591 | 8008.305657 |
| 22 | 39 | 993673.1917 | 0.998394391 | 23209.85412 | 8007.252806 |
| 23 | 40 | 993528.2657 | 0.998248776 | 23206.46899 | 8006.084959 |
| 24 | 41 | 993367.3143 | 0.99808706 | 23202.70954 | 8004.787974 |
| 25 | 42 | 993188.7709 | 0.997907669 | 23198.53919 | 8003.349229 |
| 26 | 43 | 992990.433 | 0.997708388 | 23193.90649 | 8001.750976 |
| 27 | 44 | 992770.0581 | 0.997486966 | 23188.75905 | 7999.975143 |
| 28 | 45 | 992525.4975 | 0.997241244 | 23183.0467 | 7998.004416 |
| 29 | 46 | 992253.3463 | 0.9969678 | 23176.68989 | 7995.811358 |
| 30 | 47 | 991950.2217 | 0.996663235 | 23169.60962 | 7993.368708 |
| 31 | 48 | 991611.9494 | 0.996323355 | 23161.70837 | 7990.64283 |
| 32 | 49 | 991232.9038 | 0.995942509 | 23152.85477 | 7987.588391 |
| 33 | 50 | 990807.7509 | 0.995515336 | 23142.9242 | 7984.162409 |
| 34 | 51 | 990331.2032 | 0.995036524 | 23131.79318 | 7980.322276 |
| 35 | 52 | 989798.6958 | 0.994501486 | 23119.35506 | 7976.031205 |
| 36 | 53 | 989207.9687 | 0.993907952 | 23105.55708 | 7971.270987 |
| 37 | 54 | 988558.592 | 0.99325549 | 23090.38917 | 7966.038156 |
| 38 | 55 | 987853.5739 | 0.992547123 | 23073.92162 | 7960.356955 |
| 39 | 56 | 987098.8809 | 0.991788844 | 23056.29378 | 7954.275461 |
| 40 | 57 | 986302.4301 | 0.990988609 | 23037.69057 | 7947.857472 |
| 41 | 58 | 985473.9569 | 0.990156199 | 23018.3394 | 7941.18144 |
| 42 | 59 | 984623.9601 | 0.989302164 | 22998.48548 | 7934.331965 |
| 43 | 60 | 983762.1063 | 0.988436215 | 22978.35462 | 7927.386944 |
| 44 | 61 | 982897.2152 | 0.987567215 | 22958.15281 | 7920.417448 |
| 45 | 62 | 982070.0993 | 0.986736169 | 22938.83334 | 7913.752353 |
| 46 | 63 | 981135.4087 | 0.985797038 | 22917.00118 | 7906.220395 |
| 47 | 64 | 980109.1266 | 0.984765879 | 22893.02966 | 7897.950373 |
| 48 | 65 | 979018.3821 | 0.983669953 | 22867.55245 | 7889.160896 |
| 49 | 66 | 977897.2896 | 0.982543533 | 22841.36638 | 7880.126869 |
| 50 | 67 | 976773.0433 | 0.981413946 | 22815.10665 | 7871.067427 |
| 51 | 68 | 975651.7458 | 0.98028732 | 22788.91579 | 7862.031748 |
| 52 | 69 | 974530.1844 | 0.97916043 | 22762.71877 | 7852.993941 |
| 53 | 70 | 973402.6265 | 0.978027515 | 22736.38169 | 7843.907814 |
| 54 | 71 | 972253.5459 | 0.976872975 | 22709.54188 | 7834.648251 |
| 55 | 72 | 971075.3318 | 0.975689163 | 22682.02159 | 7825.153925 |
| 56 | 73 | 969863.1266 | 0.974471198 | 22653.70735 | 7815.385689 |
| 57 | 74 | 968579.4086 | 0.973181381 | 22623.72273 | 7805.041188 |
| 58 | 75 | 967202.9455 | 0.971798378 | 22591.57181 | 7793.949323 |
| 59 | 76 | 965701.1545 | 0.970289451 | 22556.49353 | 7781.847537 |
| 60 | 77 | 964032.1491 | 0.968612516 | 22517.50951 | 7768.398299 |
| 61 | 78 | 962128.8918 | 0.966700216 | 22473.05392 | 7753.061403 |
| 62 | 79 | 959933.3582 | 0.964494251 | 22421.77146 | 7735.369275 |
| 63 | 80 | 957362.2627 | 0.961910939 | 22361.71675 | 7714.650782 |
| 64 | 81 | 954306.2755 | 0.958840432 | 22290.33612 | 7690.024916 |
| 65 | 82 | 950655.4515 | 0.955172262 | 22205.06151 | 7660.605716 |
| 66 | 83 | 946209.2119 | 0.950704897 | 22101.20788 | 7624.776869 |

## Annex 3

Excel calculations for the LoEC for a man aged 30 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 938115.05 | 292773.6 | | | 928552.2478 | 271612.2898 | 1200164.538 |
| 3 | 30 | 21321.13 | | 990279.4548 | 1 | 21321.13 | 0 | |
| 4 | 31 | 21321.13 | | 990067.8876 | 0.999786356 | 21316.57487 | 0 | |
| 5 | 32 | 21321.13 | | 989855.9319 | 0.99957232 | 21312.01138 | 0 | |
| 6 | 33 | 21321.13 | | 989642.1506 | 0.99935644 | 21307.40858 | 0 | |
| 7 | 34 | 21321.13 | | 989425.867 | 0.999138033 | 21302.7519 | 0 | |
| 8 | 35 | 23671.27 | | 989205.9533 | 0.998915961 | 23645.60942 | 0 | |
| 9 | 36 | 23671.27 | | 988980.379 | 0.998688173 | 23640.21738 | 0 | |
| 10 | 37 | 23671.27 | | 988747.3842 | 0.998452891 | 23634.64796 | 0 | |
| 11 | 38 | 23671.27 | | 988504.4786 | 0.998207601 | 23628.84163 | 0 | |
| 12 | 39 | 23671.27 | | 988248.575 | 0.997949185 | 23622.72461 | 0 | |
| 13 | 40 | 26125.41 | | 987975.6584 | 0.99767359 | 26064.63157 | 0 | |
| 14 | 41 | 26125.41 | | 987682.2665 | 0.997377318 | 26056.89135 | 0 | |
| 15 | 42 | 26125.41 | | 987364.6115 | 0.997056545 | 26048.51102 | 0 | |
| 16 | 43 | 26125.41 | | 987014.2216 | 0.996702715 | 26039.26709 | 0 | |
| 17 | 44 | 26125.41 | | 986624.8181 | 0.99630949 | 26028.9939 | 0 | |
| 18 | 45 | 27279.93 | | 986190.4314 | 0.995870839 | 27167.28678 | 0 | |
| 19 | 46 | 27279.93 | | 985703.0307 | 0.995378654 | 27153.86 | 0 | |
| 20 | 47 | 27279.93 | | 985153.7645 | 0.994823996 | 27138.72898 | 0 | |
| 21 | 48 | 27279.93 | | 984531.887 | 0.994196014 | 27121.59768 | 0 | |
| 22 | 49 | 27279.93 | | 983825.2872 | 0.993482479 | 27102.13247 | 0 | |
| 23 | 50 | 27754.07 | | 983020.9029 | 0.992670198 | 27550.63818 | 0 | |
| 24 | 51 | 27754.07 | | 982107.8137 | 0.991748146 | 27525.04748 | 0 | |
| 25 | 52 | 27754.07 | | 981076.5839 | 0.990706794 | 27496.14571 | 0 | |
| 26 | 53 | 27754.07 | | 979921.4877 | 0.98954036 | 27463.77241 | 0 | |
| 27 | 54 | 27754.07 | | 978640.665 | 0.988246964 | 27427.87543 | 0 | |
| 28 | 55 | 28713.98 | | 977236.3584 | 0.986828873 | 28335.78453 | 0 | |
| 29 | 56 | 28713.98 | | 975711.7185 | 0.985289267 | 28291.57632 | 0 | |
| 30 | 57 | 28713.98 | | 974070.0669 | 0.983631501 | 28243.97526 | 0 | |
| 31 | 58 | 28713.98 | | 972314.0413 | 0.981858239 | 28193.05783 | 0 | |
| 32 | 59 | 28713.98 | | 970446.4873 | 0.979972353 | 28138.90654 | 0 | |
| 33 | 60 | 27390.57 | | 968472.2321 | 0.977978718 | 26787.39455 | 0 | |
| 34 | 61 | 27390.57 | | 966396.0685 | 0.975882175 | 26729.96904 | 0 | |
| 35 | 62 | 27390.57 | | 964224.2338 | 0.973689022 | 26669.89731 | 0 | |
| 36 | 63 | 27390.57 | | 961795.9243 | 0.971236876 | 26602.73165 | 0 | |
| 37 | 64 | 27390.57 | | 959140.6309 | 0.968555519 | 26529.28773 | 0 | |
| 38 | 65 | 26833.25 | | 956294.4078 | 0.965681357 | 25912.36928 | 0 | |
| 39 | 66 | 0 | 16265.2 | 953312.504 | 0.962670183 | 0 | 15658.02306 | |
| 40 | 67 | 0 | 16265.2 | 950257.2733 | 0.959584962 | 0 | 15607.84133 | |
| 41 | 68 | 0 | 16265.2 | 947168.1135 | 0.956465479 | 0 | 15557.10232 | |
| 42 | 69 | 0 | 16265.2 | 944072.4642 | 0.953339443 | 0 | 15506.25672 | |
| 43 | 70 | 0 | 16265.2 | 940968.4028 | 0.950204913 | 0 | 15455.27294 | |
| 44 | 71 | 0 | 16265.2 | 937814.4385 | 0.947019989 | 0 | 15403.46953 | |
| 45 | 72 | 0 | 16265.2 | 934543.7861 | 0.943717232 | 0 | 15349.74952 | |
| 46 | 73 | 0 | 16265.2 | 931081.2411 | 0.940220699 | 0 | 15292.87771 | |
| 47 | 74 | 0 | 16265.2 | 927284.1466 | 0.936386332 | 0 | 15230.51097 | |
| 48 | 75 | 0 | 16265.2 | 923063.524 | 0.93212428 | 0 | 15161.18784 | |
| 49 | 76 | 0 | 16265.2 | 918328.7796 | 0.92734306 | 0 | 15083.42034 | |
| 50 | 77 | 0 | 16265.2 | 912994.3232 | 0.92195624 | 0 | 14995.80264 | |
| 51 | 78 | 0 | 16265.2 | 906934.5271 | 0.915836962 | 0 | 14896.27135 | |
| 52 | 79 | 0 | 16265.2 | 900051.9617 | 0.908886837 | 0 | 14783.22619 | |
| 53 | 80 | 0 | 16265.2 | 892184.7395 | 0.900942391 | 0 | 14654.00817 | |
| 54 | 81 | 0 | 16265.2 | 883133.9924 | 0.891802802 | 0 | 14505.35093 | |
| 55 | 82 | 0 | 16265.2 | 872748.5298 | 0.881315396 | 0 | 14334.77118 | |
| 56 | 83 | 0 | 16265.2 | 860716.5155 | 0.869165276 | 0 | 14137.14705 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | Ix hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 1217023.289 | 419865.334 |
| 3 | 30 | 990279.4548 | 1 | 23247.18 | 8020.13 |
| 4 | 31 | 990067.8876 | 0.999786356 | 23242.21338 | 8018.416548 |
| 5 | 32 | 989855.9319 | 0.99957232 | 23237.23764 | 8016.699949 |
| 6 | 33 | 989642.1506 | 0.99935644 | 23232.21905 | 8014.968566 |
| 7 | 34 | 989425.867 | 0.999138033 | 23227.14171 | 8013.216916 |
| 8 | 35 | 989205.9533 | 0.998915961 | 23221.97915 | 8011.435867 |
| 9 | 36 | 988980.379 | 0.998688173 | 23216.68371 | 8009.608973 |
| 10 | 37 | 988747.3842 | 0.998452891 | 23211.21407 | 8007.721982 |
| 11 | 38 | 988504.4786 | 0.998207601 | 23205.51177 | 8005.754725 |
| 12 | 39 | 988248.575 | 0.997949185 | 23199.50434 | 8003.682199 |
| 13 | 40 | 987975.6584 | 0.99767359 | 23193.09752 | 8001.471886 |
| 14 | 41 | 987682.2665 | 0.997377318 | 23186.21003 | 7999.095748 |
| 15 | 42 | 987364.6115 | 0.997056545 | 23178.75297 | 7996.523106 |
| 16 | 43 | 987014.2216 | 0.996702715 | 23170.52743 | 7993.685349 |
| 17 | 44 | 986624.8181 | 0.99630949 | 23161.38604 | 7990.531627 |
| 18 | 45 | 986190.4314 | 0.995870839 | 23151.18865 | 7987.013592 |
| 19 | 46 | 985703.0307 | 0.995378654 | 23139.74674 | 7983.066204 |
| 20 | 47 | 985153.7645 | 0.994823996 | 23126.85251 | 7978.617776 |
| 21 | 48 | 984531.887 | 0.994196014 | 23112.2537 | 7973.581281 |
| 22 | 49 | 983825.2872 | 0.993482479 | 23095.66601 | 7967.858631 |
| 23 | 50 | 983020.9029 | 0.992670198 | 23076.78278 | 7961.344039 |
| 24 | 51 | 982107.8137 | 0.991748146 | 23055.34768 | 7953.949062 |
| 25 | 52 | 981076.5839 | 0.990706794 | 23031.13917 | 7945.597281 |
| 26 | 53 | 979921.4877 | 0.98954036 | 23004.02285 | 7936.242324 |
| 27 | 54 | 978640.665 | 0.988246964 | 22973.95506 | 7925.869126 |
| 28 | 55 | 977236.3584 | 0.986828873 | 22940.98844 | 7914.49585 |
| 29 | 56 | 975711.7185 | 0.985289267 | 22905.19695 | 7902.148012 |
| 30 | 57 | 974070.0669 | 0.983631501 | 22866.65857 | 7888.852513 |
| 31 | 58 | 972314.0413 | 0.981858239 | 22825.43521 | 7874.630716 |
| 32 | 59 | 970446.4873 | 0.979972353 | 22781.59368 | 7859.505667 |
| 33 | 60 | 968472.2321 | 0.977978718 | 22735.2473 | 7843.516459 |
| 34 | 61 | 966396.0685 | 0.975882175 | 22686.50859 | 7826.701911 |
| 35 | 62 | 964224.2338 | 0.973689022 | 22635.52396 | 7809.112536 |
| 36 | 63 | 961795.9243 | 0.971236876 | 22578.51849 | 7789.446009 |
| 37 | 64 | 959140.6309 | 0.968555519 | 22516.18448 | 7767.941172 |
| 38 | 65 | 956294.4078 | 0.965681357 | 22449.36833 | 7744.890023 |
| 39 | 66 | 953312.504 | 0.962670183 | 22379.36703 | 7720.740015 |
| 40 | 67 | 950257.2733 | 0.959584962 | 22307.64435 | 7695.996144 |
| 41 | 68 | 947168.1135 | 0.956465479 | 22235.12516 | 7670.977486 |
| 42 | 69 | 944072.4642 | 0.953339443 | 22162.45364 | 7645.90627 |
| 43 | 70 | 940968.4028 | 0.950204913 | 22089.58464 | 7620.766926 |
| 44 | 71 | 937814.4385 | 0.947019989 | 22015.54415 | 7595.223425 |
| 45 | 72 | 934543.7861 | 0.943717232 | 21938.76436 | 7568.734885 |
| 46 | 73 | 931081.2411 | 0.940220699 | 21857.47983 | 7540.692234 |
| 47 | 74 | 927284.1466 | 0.936386332 | 21768.34162 | 7509.940115 |
| 48 | 75 | 923063.524 | 0.93212428 | 21669.26092 | 7475.757904 |
| 49 | 76 | 918328.7796 | 0.92734306 | 21558.11103 | 7437.411894 |
| 50 | 77 | 912994.3232 | 0.92195624 | 21432.88267 | 7394.208903 |
| 51 | 78 | 906934.5271 | 0.915836962 | 21290.6267 | 7345.131492 |
| 52 | 79 | 900051.9617 | 0.908886837 | 21129.05591 | 7289.390591 |
| 53 | 80 | 892184.7395 | 0.900942391 | 20944.36993 | 7225.675097 |
| 54 | 81 | 883133.9924 | 0.891802802 | 20731.90026 | 7152.374406 |
| 55 | 82 | 872748.5298 | 0.881315396 | 20488.09765 | 7068.264047 |
| 56 | 83 | 860716.5155 | 0.869165276 | 20205.64162 | 6970.818504 |

## Annex 4

Excel calculations for the LoEC for a woman aged 30 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 938115.05 | 292773.6 | | | 932181.0416 | 282044.854 | 1214225.896 |
| 3 | 30 | 21321.13 | | 991909.7913 | 1 | 21321.13 | 0 | |
| 4 | 31 | 21321.13 | | 991801.1738 | 0.999890497 | 21318.79526 | 0 | |
| 5 | 32 | 21321.13 | | 991688.6446 | 0.99977705 | 21316.37644 | 0 | |
| 6 | 33 | 21321.13 | | 991571.8752 | 0.999659328 | 21313.86648 | 0 | |
| 7 | 34 | 21321.13 | | 991449.2952 | 0.999535748 | 21311.23162 | 0 | |
| 8 | 35 | 23671.27 | | 991319.3721 | 0.999404765 | 23657.18004 | 0 | |
| 9 | 36 | 23671.27 | | 991180.0056 | 0.999264262 | 23653.85415 | 0 | |
| 10 | 37 | 23671.27 | | 991029.1233 | 0.999112149 | 23650.25344 | 0 | |
| 11 | 38 | 23671.27 | | 990864.6892 | 0.998946374 | 23646.32933 | 0 | |
| 12 | 39 | 23671.27 | | 990684.214 | 0.998764427 | 23642.02241 | 0 | |
| 13 | 40 | 26125.41 | | 990485.8939 | 0.998564489 | 26087.90669 | 0 | |
| 14 | 41 | 26125.41 | | 990267.5962 | 0.998344411 | 26082.15705 | 0 | |
| 15 | 42 | 26125.41 | | 990027.4027 | 0.998102258 | 26075.83072 | 0 | |
| 16 | 43 | 26125.41 | | 989762.5429 | 0.997835238 | 26068.85471 | 0 | |
| 17 | 44 | 26125.41 | | 989470.2806 | 0.997540592 | 26061.15696 | 0 | |
| 18 | 45 | 27279.93 | | 989148.1752 | 0.99721586 | 27203.97885 | 0 | |
| 19 | 46 | 27279.93 | | 988792.385 | 0.996857168 | 27194.19375 | 0 | |
| 20 | 47 | 27279.93 | | 988399.4124 | 0.99646099 | 27183.38605 | 0 | |
| 21 | 48 | 27279.93 | | 987965.0465 | 0.996023081 | 27171.43993 | 0 | |
| 22 | 49 | 27279.93 | | 987483.4932 | 0.9955376 | 27158.19604 | 0 | |
| 23 | 50 | 27754.07 | | 986949.5196 | 0.994999271 | 27615.27943 | 0 | |
| 24 | 51 | 27754.07 | | 986357.9578 | 0.994402885 | 27598.72727 | 0 | |
| 25 | 52 | 27754.07 | | 985704.3226 | 0.993743918 | 27580.43827 | 0 | |
| 26 | 53 | 27754.07 | | 984986.492 | 0.993020233 | 27560.35306 | 0 | |
| 27 | 54 | 27754.07 | | 984203.8848 | 0.992231243 | 27538.45536 | 0 | |
| 28 | 55 | 28713.98 | | 983359.2946 | 0.991379764 | 28466.45871 | 0 | |
| 29 | 56 | 28713.98 | | 982458.3492 | 0.99047147 | 28440.37798 | 0 | |
| 30 | 57 | 28713.98 | | 981508.526 | 0.9895139 | 28412.88233 | 0 | |
| 31 | 58 | 28713.98 | | 980519.3104 | 0.988516616 | 28384.24635 | 0 | |
| 32 | 59 | 28713.98 | | 979501.252 | 0.987490254 | 28354.77541 | 0 | |
| 33 | 60 | 27390.57 | | 978464.2795 | 0.986444824 | 27019.286 | 0 | |
| 34 | 61 | 27390.57 | | 977417.7642 | 0.985389773 | 26990.38756 | 0 | |
| 35 | 62 | 27390.57 | | 976410.4789 | 0.984374272 | 26962.57241 | 0 | |
| 36 | 63 | 27390.57 | | 975264.0599 | 0.983218503 | 26930.91523 | 0 | |
| 37 | 64 | 27390.57 | | 973995.5811 | 0.981939678 | 26895.88749 | 0 | |
| 38 | 65 | 26833.25 | | 972636.203 | 0.980569213 | 26311.85882 | 0 | |
| 39 | 66 | 0 | 16265.2 | 971226.4934 | 0.979148005 | 0 | 15926.03813 | |
| 40 | 67 | 0 | 16265.2 | 969799.3144 | 0.977709186 | 0 | 15902.63545 | |
| 41 | 68 | 0 | 16265.2 | 968363.0459 | 0.976261203 | 0 | 15879.08372 | |
| 42 | 69 | 0 | 16265.2 | 966913.147 | 0.974799478 | 0 | 15855.30847 | |
| 43 | 70 | 0 | 16265.2 | 965442.1327 | 0.973316466 | 0 | 15831.18698 | |
| 44 | 71 | 0 | 16265.2 | 963931.4786 | 0.971793491 | 0 | 15806.41548 | |
| 45 | 72 | 0 | 16265.2 | 962371.8203 | 0.970221112 | 0 | 15780.84042 | |
| 46 | 73 | 0 | 16265.2 | 960756.2454 | 0.96859236 | 0 | 15754.34845 | |
| 47 | 74 | 0 | 16265.2 | 959039.4788 | 0.966861591 | 0 | 15726.19715 | |
| 48 | 75 | 0 | 16265.2 | 957193.3567 | 0.965000411 | 0 | 15695.92469 | |
| 49 | 76 | 0 | 16265.2 | 955176.7385 | 0.962967345 | 0 | 15662.85646 | |
| 50 | 77 | 0 | 16265.2 | 952936.9858 | 0.960709325 | 0 | 15626.12931 | |
| 51 | 78 | 0 | 16265.2 | 950391.9406 | 0.958143522 | 0 | 15584.39601 | |
| 52 | 79 | 0 | 16265.2 | 947469.4827 | 0.955197228 | 0 | 15536.47395 | |
| 53 | 80 | 0 | 16265.2 | 944069.8607 | 0.951769878 | 0 | 15480.72741 | |
| 54 | 81 | 0 | 16265.2 | 940064.3399 | 0.947731687 | 0 | 15415.04544 | |
| 55 | 82 | 0 | 16265.2 | 935325.7828 | 0.942954481 | 0 | 15337.34323 | |
| 56 | 83 | 0 | 16265.2 | 929627.4816 | 0.937209704 | 0 | 15243.90327 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 1235004.777 | 426068.8334 |
| 3 | 30 | 991909.7913 | 1 | 23247.18 | 8020.13 |
| 4 | 31 | 991801.1738 | 0.999890497 | 23244.63435 | 8019.251768 |
| 5 | 32 | 991688.6446 | 0.99977705 | 23241.99703 | 8018.341908 |
| 6 | 33 | 991571.8752 | 0.999659328 | 23239.26033 | 8017.397764 |
| 7 | 34 | 991449.2952 | 0.999535748 | 23236.38745 | 8016.406638 |
| 8 | 35 | 991319.3721 | 0.999404765 | 23233.34247 | 8015.35614 |
| 9 | 36 | 991180.0056 | 0.999264262 | 23230.07617 | 8014.229285 |
| 10 | 37 | 991029.1233 | 0.999112149 | 23226.53997 | 8013.00932 |
| 11 | 38 | 990864.6892 | 0.998946374 | 23222.68616 | 8011.679782 |
| 12 | 39 | 990684.214 | 0.998764427 | 23218.4564 | 8010.220541 |
| 13 | 40 | 990485.8939 | 0.998564489 | 23213.80842 | 8008.617015 |
| 14 | 41 | 990267.5962 | 0.998344411 | 23208.69222 | 8006.85196 |
| 15 | 42 | 990027.4027 | 0.998102258 | 23203.06286 | 8004.909864 |
| 16 | 43 | 989762.5429 | 0.997835238 | 23196.85539 | 8002.768329 |
| 17 | 44 | 989470.2806 | 0.997540592 | 23190.0057 | 8000.40523 |
| 18 | 45 | 989148.1752 | 0.99721586 | 23182.45659 | 7997.800832 |
| 19 | 46 | 988792.385 | 0.996857168 | 23174.11801 | 7994.924075 |
| 20 | 47 | 988399.4124 | 0.99646099 | 23164.90799 | 7991.746678 |
| 21 | 48 | 987965.0465 | 0.996023081 | 23154.72785 | 7988.234594 |
| 22 | 49 | 987483.4932 | 0.9955376 | 23143.44179 | 7984.340973 |
| 23 | 50 | 986949.5196 | 0.994999271 | 23130.92716 | 7980.023506 |
| 24 | 51 | 986357.9578 | 0.994402885 | 23117.06285 | 7975.240407 |
| 25 | 52 | 985704.3226 | 0.993743918 | 23101.74374 | 7969.955411 |
| 26 | 53 | 984986.492 | 0.993020233 | 23084.9201 | 7964.151361 |
| 27 | 54 | 984203.8848 | 0.992231243 | 23066.5783 | 7957.823556 |
| 28 | 55 | 983359.2946 | 0.991379764 | 23046.78382 | 7950.994585 |
| 29 | 56 | 982458.3492 | 0.99047147 | 23025.66855 | 7943.709952 |
| 30 | 57 | 981508.526 | 0.9895139 | 23003.40775 | 7936.030115 |
| 31 | 58 | 980519.3104 | 0.988516616 | 22980.22371 | 7928.031769 |
| 32 | 59 | 979501.252 | 0.987490254 | 22956.36369 | 7919.800213 |
| 33 | 60 | 978464.2795 | 0.986444824 | 22932.06038 | 7911.415726 |
| 34 | 61 | 977417.7642 | 0.985389773 | 22907.53343 | 7902.954081 |
| 35 | 62 | 976410.4789 | 0.984374272 | 22883.92589 | 7894.809631 |
| 36 | 63 | 975264.0599 | 0.983218503 | 22857.05751 | 7885.540211 |
| 37 | 64 | 973995.5811 | 0.981939678 | 22827.32844 | 7875.28387 |
| 38 | 65 | 972636.203 | 0.980569213 | 22795.46899 | 7864.292559 |
| 39 | 66 | 971226.4934 | 0.979148005 | 22762.42992 | 7852.89429 |
| 40 | 67 | 969799.3144 | 0.977709186 | 22728.98143 | 7841.354772 |
| 41 | 68 | 968363.0459 | 0.976261203 | 22695.31991 | 7829.74176 |
| 42 | 69 | 966913.147 | 0.974799478 | 22661.33893 | 7818.018539 |
| 43 | 70 | 965442.1327 | 0.973316466 | 22626.86308 | 7806.124589 |
| 44 | 71 | 963931.4786 | 0.971793491 | 22591.4582 | 7793.910129 |
| 45 | 72 | 962371.8203 | 0.970221112 | 22554.90482 | 7781.299444 |
| 46 | 73 | 960756.2454 | 0.96859236 | 22517.04093 | 7768.236642 |
| 47 | 74 | 959039.4788 | 0.966861591 | 22476.80544 | 7754.355651 |
| 48 | 75 | 957193.3567 | 0.965000411 | 22433.53826 | 7739.428749 |
| 49 | 76 | 955176.7385 | 0.962967345 | 22386.27521 | 7723.123295 |
| 50 | 77 | 952936.9858 | 0.960709325 | 22333.7826 | 7705.013676 |
| 51 | 78 | 950391.9406 | 0.958143522 | 22274.13491 | 7684.435602 |
| 52 | 79 | 947469.4827 | 0.955197228 | 22205.64189 | 7660.805941 |
| 53 | 80 | 944069.8607 | 0.951769878 | 22125.96566 | 7633.318149 |
| 54 | 81 | 940064.3399 | 0.947731687 | 22032.08912 | 7600.931335 |
| 55 | 82 | 935325.7828 | 0.942954481 | 21921.03256 | 7562.617524 |
| 56 | 83 | 929627.4816 | 0.937209704 | 21787.48268 | 7516.543661 |

## Annex 5

Excel calculations for the LoEC for a man aged 40 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 713153.05 | 292773.6 | | | 703032.8829 | 266950.0302 | 969982.9131 |
| 3 | 40 | 26125.41 | | 982106.1292 | 1 | 26125.41 | 0 | |
| 4 | 41 | 26125.41 | | 981671.0402 | 0.999556984 | 26113.83602 | 0 | |
| 5 | 42 | 26125.41 | | 981200.0388 | 0.999077401 | 26101.30672 | 0 | |
| 6 | 43 | 26125.41 | | 980684.7868 | 0.998552761 | 26087.60029 | 0 | |
| 7 | 44 | 26125.41 | | 980117.6198 | 0.99797526 | 26072.51284 | 0 | |
| 8 | 45 | 27279.93 | | 979491.8639 | 0.997338103 | 27207.31364 | 0 | |
| 9 | 46 | 27279.93 | | 978798.5704 | 0.996632178 | 27188.05605 | 0 | |
| 10 | 47 | 27279.93 | | 978028.4765 | 0.995848053 | 27166.66517 | 0 | |
| 11 | 48 | 27279.93 | | 977170.5934 | 0.994974539 | 27142.83578 | 0 | |
| 12 | 49 | 27279.93 | | 976212.8502 | 0.993999346 | 27116.23258 | 0 | |
| 13 | 50 | 27754.07 | | 975142.038 | 0.992909024 | 27557.26655 | 0 | |
| 14 | 51 | 27754.07 | | 973947.239 | 0.991692456 | 27523.50183 | 0 | |
| 15 | 52 | 27754.07 | | 972618.501 | 0.990339508 | 27485.95204 | 0 | |
| 16 | 53 | 27754.07 | | 971149.3189 | 0.988843558 | 27444.43332 | 0 | |
| 17 | 54 | 27754.07 | | 969536.6164 | 0.987201472 | 27398.85876 | 0 | |
| 18 | 55 | 28713.98 | | 967781.3547 | 0.98541423 | 28295.16448 | 0 | |
| 19 | 56 | 28713.98 | | 965885.3478 | 0.983483678 | 28239.73065 | 0 | |
| 20 | 57 | 28713.98 | | 963851.1223 | 0.981412389 | 28180.2557 | 0 | |
| 21 | 58 | 28713.98 | | 961681.2448 | 0.979202976 | 28116.81468 | 0 | |
| 22 | 59 | 28713.98 | | 959379.1329 | 0.97685892 | 28049.5075 | 0 | |
| 23 | 60 | 27390.57 | | 956950.9281 | 0.974386474 | 26689.00092 | 0 | |
| 24 | 61 | 27390.57 | | 954402.562 | 0.971791677 | 26617.92795 | 0 | |
| 25 | 62 | 27390.57 | | 951741.031 | 0.969081653 | 26543.69885 | 0 | |
| 26 | 63 | 27390.57 | | 948767.674 | 0.966054122 | 26460.77304 | 0 | |
| 27 | 64 | 27390.57 | | 945515.7203 | 0.962742918 | 26370.07728 | 0 | |
| 28 | 65 | 26833.25 | | 942025.1036 | 0.959188702 | 25738.15025 | 0 | |
| 29 | 66 | 0 | 16265.2 | 938358.3726 | 0.955455164 | 0 | 15540.66933 | |
| 30 | 67 | 0 | 16265.2 | 934587.2972 | 0.95161538 | 0 | 15478.21448 | |
| 31 | 68 | 0 | 16265.2 | 930760.8921 | 0.947719258 | 0 | 15414.84328 | |
| 32 | 69 | 0 | 16265.2 | 926911.7852 | 0.943800021 | 0 | 15351.0961 | |
| 33 | 70 | 0 | 16265.2 | 923038.1446 | 0.939855803 | 0 | 15286.94261 | |
| 34 | 71 | 0 | 16265.2 | 919093.7238 | 0.935839515 | 0 | 15221.61688 | |
| 35 | 72 | 0 | 16265.2 | 914997.8711 | 0.931669036 | 0 | 15153.78321 | |
| 36 | 73 | 0 | 16265.2 | 910656.1251 | 0.927248184 | 0 | 15081.87717 | |
| 37 | 74 | 0 | 16265.2 | 905903.4151 | 0.92240888 | 0 | 15003.16492 | |
| 38 | 75 | 0 | 16265.2 | 900630.2194 | 0.917039608 | 0 | 14915.83263 | |
| 39 | 76 | 0 | 16265.2 | 894730.8802 | 0.911032783 | 0 | 14818.13042 | |
| 40 | 77 | 0 | 16265.2 | 888107.9153 | 0.904289149 | 0 | 14708.44386 | |
| 41 | 78 | 0 | 16265.2 | 880624.5282 | 0.896669415 | 0 | 14584.50737 | |
| 42 | 79 | 0 | 16265.2 | 872169.2942 | 0.888060127 | 0 | 14444.47558 | |
| 43 | 80 | 0 | 16265.2 | 862564.8062 | 0.878280647 | 0 | 14285.41037 | |
| 44 | 81 | 0 | 16265.2 | 851598.6618 | 0.8671147 | 0 | 14103.79402 | |
| 45 | 82 | 0 | 16265.2 | 839116.6606 | 0.854405278 | 0 | 13897.07273 | |
| 46 | 83 | 0 | 16265.2 | 824811.3889 | 0.839839366 | 0 | 13660.15526 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | Ix hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 977471.8689 | 337221.6097 |
| 3 | 40 | 982106.1292 | 1 | 23247.18 | 8020.13 |
| 4 | 41 | 981671.0402 | 0.999556984 | 23236.88112 | 8016.576952 |
| 5 | 42 | 981200.0388 | 0.999077401 | 23225.73217 | 8012.730634 |
| 6 | 43 | 980684.7868 | 0.998552761 | 23213.53577 | 8008.522954 |
| 7 | 44 | 980117.6198 | 0.99797526 | 23200.11051 | 8003.891324 |
| 8 | 45 | 979491.8639 | 0.997338103 | 23185.2984 | 7998.781241 |
| 9 | 46 | 978798.5704 | 0.996632178 | 23168.88763 | 7993.119629 |
| 10 | 47 | 978028.4765 | 0.995848053 | 23150.65894 | 7986.830845 |
| 11 | 48 | 977170.5934 | 0.994974539 | 23130.35221 | 7979.825152 |
| 12 | 49 | 976212.8502 | 0.993999346 | 23107.68172 | 7972.003975 |
| 13 | 50 | 975142.038 | 0.992909024 | 23082.3348 | 7963.259449 |
| 14 | 51 | 973947.239 | 0.991692456 | 23054.05302 | 7953.502414 |
| 15 | 52 | 972618.501 | 0.990339508 | 23022.60081 | 7942.651601 |
| 16 | 53 | 971149.3189 | 0.988843558 | 22987.82418 | 7930.653883 |
| 17 | 54 | 969536.6164 | 0.987201472 | 22949.65032 | 7917.484142 |
| 18 | 55 | 967781.3547 | 0.98541423 | 22908.10197 | 7903.150226 |
| 19 | 56 | 965885.3478 | 0.983483678 | 22863.22208 | 7887.666948 |
| 20 | 57 | 963851.1223 | 0.981412389 | 22815.07046 | 7871.054942 |
| 21 | 58 | 961681.2448 | 0.979202976 | 22763.70785 | 7853.335167 |
| 22 | 59 | 959379.1329 | 0.97685892 | 22709.21515 | 7834.535532 |
| 23 | 60 | 956950.9281 | 0.974386474 | 22651.73775 | 7814.70619 |
| 24 | 61 | 954402.562 | 0.971791677 | 22591.41603 | 7793.895581 |
| 25 | 62 | 951741.031 | 0.969081653 | 22528.41562 | 7772.160837 |
| 26 | 63 | 948767.674 | 0.966054122 | 22458.03406 | 7747.879642 |
| 27 | 64 | 945515.7203 | 0.962742918 | 22381.0579 | 7721.323357 |
| 28 | 65 | 942025.1036 | 0.959188702 | 22298.43242 | 7692.818088 |
| 29 | 66 | 938358.3726 | 0.955455164 | 22211.63818 | 7662.874623 |
| 30 | 67 | 934587.2972 | 0.95161538 | 22122.37403 | 7632.079056 |
| 31 | 68 | 930760.8921 | 0.947719258 | 22031.80018 | 7600.831654 |
| 32 | 69 | 926911.7852 | 0.943800021 | 21940.68897 | 7569.398861 |
| 33 | 70 | 923038.1446 | 0.939855803 | 21848.99702 | 7537.765721 |
| 34 | 71 | 919093.7238 | 0.935839515 | 21755.62966 | 7505.554571 |
| 35 | 72 | 914997.8711 | 0.931669036 | 21658.67779 | 7472.106789 |
| 36 | 73 | 910656.1251 | 0.927248184 | 21555.90545 | 7436.650981 |
| 37 | 74 | 905903.4151 | 0.92240888 | 21443.40528 | 7397.839135 |
| 38 | 75 | 900630.2194 | 0.917039608 | 21318.58483 | 7354.776869 |
| 39 | 76 | 894730.8802 | 0.911032783 | 21178.9431 | 7306.601355 |
| 40 | 77 | 888107.9153 | 0.904289149 | 21022.17261 | 7252.516529 |
| 41 | 78 | 880624.5282 | 0.896669415 | 20845.03529 | 7191.405274 |
| 42 | 79 | 872169.2942 | 0.888060127 | 20644.89363 | 7122.357669 |
| 43 | 80 | 862564.8062 | 0.878280647 | 20417.54828 | 7043.924962 |
| 44 | 81 | 851598.6618 | 0.8671147 | 20157.97152 | 6954.372621 |
| 45 | 82 | 839116.6606 | 0.854405278 | 19862.5133 | 6852.441404 |
| 46 | 83 | 824811.3889 | 0.839839366 | 19523.89691 | 6735.620894 |

## Annex 6

Excel calculations for the LoEC for a woman aged 40 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 713153.05 | 292773.6 | | | 707160.7393 | 279640.2429 | 986800.9822 |
| 3 | 40 | 26125.41 | | 986014.2636 | 1 | 26125.41 | 0 | |
| 4 | 41 | 26125.41 | | 985718.6187 | 0.999700162 | 26117.5766 | 0 | |
| 5 | 42 | 26125.41 | | 985395.9652 | 0.999372932 | 26109.02758 | 0 | |
| 6 | 43 | 26125.41 | | 985042.8026 | 0.99901476 | 26099.67019 | 0 | |
| 7 | 44 | 26125.41 | | 984655.7933 | 0.998622261 | 26089.416 | 0 | |
| 8 | 45 | 27279.93 | | 984232.2117 | 0.998192671 | 27230.6262 | 0 | |
| 9 | 46 | 27279.93 | | 983767.8095 | 0.997721682 | 27217.77764 | 0 | |
| 10 | 47 | 27279.93 | | 983259.1721 | 0.99720583 | 27203.70524 | 0 | |
| 11 | 48 | 27279.93 | | 982702.3225 | 0.996641082 | 27188.29895 | 0 | |
| 12 | 49 | 27279.93 | | 982091.5522 | 0.996021648 | 27171.40085 | 0 | |
| 13 | 50 | 27754.07 | | 981422.034 | 0.995342634 | 27624.80913 | 0 | |
| 14 | 51 | 27754.07 | | 980688.9576 | 0.994599159 | 27604.17469 | 0 | |
| 15 | 52 | 27754.07 | | 979888.04 | 0.993786881 | 27581.63067 | 0 | |
| 16 | 53 | 27754.07 | | 979017.3029 | 0.992903794 | 27557.12139 | 0 | |
| 17 | 54 | 27754.07 | | 978075.8287 | 0.991948965 | 27530.62102 | 0 | |
| 18 | 55 | 28713.98 | | 977065.8862 | 0.990924698 | 28453.39196 | 0 | |
| 19 | 56 | 28713.98 | | 975992.3455 | 0.98983593 | 28422.12909 | 0 | |
| 20 | 57 | 28713.98 | | 974861.755 | 0.988689303 | 28389.20487 | 0 | |
| 21 | 58 | 28713.98 | | 973682.8781 | 0.987493705 | 28354.87449 | 0 | |
| 22 | 59 | 28713.98 | | 972465.9119 | 0.986259477 | 28319.4349 | 0 | |
| 23 | 60 | 27390.57 | | 971220.7217 | 0.984996625 | 26979.619 | 0 | |
| 24 | 61 | 27390.57 | | 969957.0106 | 0.983714989 | 26944.51427 | 0 | |
| 25 | 62 | 27390.57 | | 968732.8489 | 0.982473464 | 26910.50818 | 0 | |
| 26 | 63 | 27390.57 | | 967329.7107 | 0.981050423 | 26871.53029 | 0 | |
| 27 | 64 | 27390.57 | | 965765.2712 | 0.979463794 | 26828.0716 | 0 | |
| 28 | 65 | 26833.25 | | 964074.871 | 0.977749417 | 26236.19453 | 0 | |
| 29 | 66 | 0 | 16265.2 | 962306.3157 | 0.975955776 | 0 | 15874.11589 | |
| 30 | 67 | 0 | 16265.2 | 960498.888 | 0.974122711 | 0 | 15844.30073 | |
| 31 | 68 | 0 | 16265.2 | 958663.7143 | 0.972261507 | 0 | 15814.02787 | |
| 32 | 69 | 0 | 16265.2 | 956794.1642 | 0.970365439 | 0 | 15783.18795 | |
| 33 | 70 | 0 | 16265.2 | 954880.2001 | 0.968424327 | 0 | 15751.61537 | |
| 34 | 71 | 0 | 16265.2 | 952899.729 | 0.966415765 | 0 | 15718.9457 | |
| 35 | 72 | 0 | 16265.2 | 950841.1426 | 0.964327979 | 0 | 15684.98745 | |
| 36 | 73 | 0 | 16265.2 | 948694.5327 | 0.962150922 | 0 | 15649.57717 | |
| 37 | 74 | 0 | 16265.2 | 946405.9673 | 0.959829895 | 0 | 15611.82521 | |
| 38 | 75 | 0 | 16265.2 | 943938.2465 | 0.957327172 | 0 | 15571.11792 | |
| 39 | 76 | 0 | 16265.2 | 941239.8876 | 0.954590539 | 0 | 15526.60604 | |
| 40 | 77 | 0 | 16265.2 | 938245.4312 | 0.951553609 | 0 | 15477.20976 | |
| 41 | 78 | 0 | 16265.2 | 934855.6389 | 0.948115736 | 0 | 15421.29206 | |
| 42 | 79 | 0 | 16265.2 | 930981.9142 | 0.944187066 | 0 | 15357.39146 | |
| 43 | 80 | 0 | 16265.2 | 926506.8948 | 0.939648572 | 0 | 15283.57195 | |
| 44 | 81 | 0 | 16265.2 | 921281.9326 | 0.934349498 | 0 | 15197.38146 | |
| 45 | 82 | 0 | 16265.2 | 915163.129 | 0.928143905 | 0 | 15096.44624 | |
| 46 | 83 | 0 | 16265.2 | 907900.5014 | 0.920778263 | 0 | 14976.64261 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 999077.1999 | 344675.3122 |
| 3 | 40 | 986014.2636 | 1 | 23247.18 | 8020.13 |
| 4 | 41 | 985718.6187 | 0.999700162 | 23240.2096 | 8017.725258 |
| 5 | 42 | 985395.9652 | 0.999372932 | 23232.60243 | 8015.10083 |
| 6 | 43 | 985042.8026 | 0.99901476 | 23224.27594 | 8012.228245 |
| 7 | 44 | 984655.7933 | 0.998622261 | 23215.15145 | 8009.080354 |
| 8 | 45 | 984232.2117 | 0.998192671 | 23205.1647 | 8005.634989 |
| 9 | 46 | 983767.8095 | 0.997721682 | 23194.21553 | 8001.857593 |
| 10 | 47 | 983259.1721 | 0.99720583 | 23182.22343 | 7997.720393 |
| 11 | 48 | 982702.3225 | 0.996641082 | 23169.09463 | 7993.191041 |
| 12 | 49 | 982091.5522 | 0.996021648 | 23154.69454 | 7988.223103 |
| 13 | 50 | 981422.034 | 0.995342634 | 23138.90937 | 7982.777317 |
| 14 | 51 | 980688.9576 | 0.994599159 | 23121.62568 | 7976.814555 |
| 15 | 52 | 979888.04 | 0.993786881 | 23102.74251 | 7970.299981 |
| 16 | 53 | 979017.3029 | 0.992903794 | 23082.21321 | 7963.217502 |
| 17 | 54 | 978075.8287 | 0.991948965 | 23060.01615 | 7955.559657 |
| 18 | 55 | 977065.8862 | 0.990924698 | 23036.20482 | 7947.344897 |
| 19 | 56 | 975992.3455 | 0.98983593 | 23010.89403 | 7938.612836 |
| 20 | 57 | 974861.755 | 0.988689303 | 22984.23819 | 7929.416739 |
| 21 | 58 | 973682.8781 | 0.987493705 | 22956.4439 | 7919.827887 |
| 22 | 59 | 972465.9119 | 0.986259477 | 22927.75159 | 7909.929219 |
| 23 | 60 | 971220.7217 | 0.984996625 | 22898.39384 | 7899.800981 |
| 24 | 61 | 969957.0106 | 0.983714989 | 22868.59942 | 7889.522096 |
| 25 | 62 | 968732.8489 | 0.982473464 | 22839.73746 | 7879.564901 |
| 26 | 63 | 967329.7107 | 0.981050423 | 22806.65578 | 7868.151932 |
| 27 | 64 | 965765.2712 | 0.979463794 | 22769.77111 | 7855.426955 |
| 28 | 65 | 964074.871 | 0.977749417 | 22729.91668 | 7841.677429 |
| 29 | 66 | 962306.3157 | 0.975955776 | 22688.2196 | 7827.292197 |
| 30 | 67 | 960498.888 | 0.974122711 | 22645.60601 | 7812.590782 |
| 31 | 68 | 958663.7143 | 0.972261507 | 22602.33827 | 7797.663684 |
| 32 | 69 | 956794.1642 | 0.970365439 | 22558.26004 | 7782.456972 |
| 33 | 70 | 954880.2001 | 0.968424327 | 22513.13466 | 7766.889002 |
| 34 | 71 | 952899.729 | 0.966415765 | 22466.44125 | 7750.780071 |
| 35 | 72 | 950841.1426 | 0.964327979 | 22417.90612 | 7734.035758 |
| 36 | 73 | 948694.5327 | 0.962150922 | 22367.29567 | 7716.575473 |
| 37 | 74 | 946405.9673 | 0.959829895 | 22313.33834 | 7697.960537 |
| 38 | 75 | 943938.2465 | 0.957327172 | 22255.15709 | 7677.888372 |
| 39 | 76 | 941239.8876 | 0.954590539 | 22191.53809 | 7655.940222 |
| 40 | 77 | 938245.4312 | 0.951553609 | 22120.93803 | 7631.583647 |
| 41 | 78 | 934855.6389 | 0.948115736 | 22041.01717 | 7604.011455 |
| 42 | 79 | 930981.9142 | 0.944187066 | 21949.68667 | 7572.503011 |
| 43 | 80 | 926506.8948 | 0.939648572 | 21844.17949 | 7536.103702 |
| 44 | 81 | 921281.9326 | 0.934349498 | 21720.99097 | 7493.604442 |
| 45 | 82 | 915163.129 | 0.928143905 | 21576.72842 | 7443.834777 |
| 46 | 83 | 907900.5014 | 0.920778263 | 21405.49803 | 7384.761374 |

## Annex 7

Excel calculations for the LoEC for a man aged 50 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 446126.35 | 309038.8 | | | 438189.9945 | 275834.2526 | 714024.247 |
| 3 | 50 | 27754.07 | | 963635.1258 | 1 | 27754.07 | 0 | |
| 4 | 51 | 27754.07 | | 962077.6685 | 0.998383769 | 27709.213 | 0 | |
| 5 | 52 | 27754.07 | | 960372.2867 | 0.996614031 | 27660.09557 | 0 | |
| 6 | 53 | 27754.07 | | 958511.0973 | 0.994682605 | 27606.49065 | 0 | |
| 7 | 54 | 27754.07 | | 956488.8421 | 0.992584036 | 27548.24681 | 0 | |
| 8 | 55 | 28713.98 | | 954304.1185 | 0.990316867 | 28435.93871 | 0 | |
| 9 | 56 | 28713.98 | | 951956.4083 | 0.987880561 | 28365.98266 | 0 | |
| 10 | 57 | 28713.98 | | 949446.8077 | 0.985276255 | 28291.20267 | 0 | |
| 11 | 58 | 28713.98 | | 946777.6112 | 0.98250633 | 28211.66712 | 0 | |
| 12 | 59 | 28713.98 | | 943952.9138 | 0.979575037 | 28127.49802 | 0 | |
| 13 | 60 | 27390.57 | | 940980.5039 | 0.976490456 | 26746.6302 | 0 | |
| 14 | 61 | 27390.57 | | 937867.7088 | 0.973260193 | 26658.15145 | 0 | |
| 15 | 62 | 27390.57 | | 934622.2968 | 0.969892309 | 26565.90317 | 0 | |
| 16 | 63 | 27390.57 | | 931000.1447 | 0.966133467 | 26462.94635 | 0 | |
| 17 | 64 | 27390.57 | | 927038.3762 | 0.962022192 | 26350.3362 | 0 | |
| 18 | 65 | 26833.25 | | 922780.6486 | 0.95760379 | 25695.6219 | 0 | |
| 19 | 66 | 0 | 16265.2 | 918297.02 | 0.952950962 | 0 | 15499.93799 | |
| 20 | 67 | 0 | 16265.2 | 913669.2962 | 0.948148601 | 0 | 15421.82662 | |
| 21 | 68 | 0 | 16265.2 | 908958.0915 | 0.943259608 | 0 | 15342.30618 | |
| 22 | 69 | 0 | 16265.2 | 904201.8612 | 0.938323891 | 0 | 15262.02576 | |
| 23 | 70 | 0 | 16265.2 | 899398.9753 | 0.933339758 | 0 | 15180.95783 | |
| 24 | 71 | 0 | 16265.2 | 894498.9555 | 0.928254826 | 0 | 15098.25039 | |
| 25 | 72 | 0 | 16265.2 | 889405.2781 | 0.922968927 | 0 | 15012.27419 | |
| 26 | 73 | 0 | 16265.2 | 884000.317 | 0.917359998 | 0 | 14921.04384 | |
| 27 | 74 | 0 | 16265.2 | 878096.0989 | 0.911232971 | 0 | 14821.38652 | |
| 28 | 75 | 0 | 16265.2 | 871559.3418 | 0.904449535 | 0 | 14711.05258 | |
| 29 | 76 | 0 | 16265.2 | 864269.0364 | 0.896884114 | 0 | 14587.9995 | |
| 30 | 77 | 0 | 16265.2 | 856116.7951 | 0.88842423 | 0 | 14450.39779 | |
| 31 | 78 | 0 | 16265.2 | 846958.6392 | 0.878920472 | 0 | 14295.81726 | |
| 32 | 79 | 0 | 16265.2 | 836670.0103 | 0.868243579 | 0 | 14122.15546 | |
| 33 | 80 | 0 | 16265.2 | 825062.2824 | 0.856197808 | 0 | 13926.22859 | |
| 34 | 81 | 0 | 16265.2 | 811916.6481 | 0.842556094 | 0 | 13704.34339 | |
| 35 | 82 | 0 | 16265.2 | 797084.273 | 0.827163987 | 0 | 13453.98769 | |
| 36 | 83 | 0 | 16265.2 | 780280.6643 | 0.809726258 | 0 | 13170.35953 | |
| 37 | 84 | 0 | 16265.2 | 761413.5494 | 0.790147151 | 0 | 12851.90144 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 759526.6266 | 262031.8802 |
| 3 | 50 | 963635.1258 | 1 | 23247.18 | 8020.13 |
| 4 | 51 | 962077.6685 | 0.998383769 | 23209.60718 | 8007.167615 |
| 5 | 52 | 960372.2867 | 0.996614031 | 23168.46576 | 7992.974085 |
| 6 | 53 | 958511.0973 | 0.994682605 | 23123.56556 | 7977.483802 |
| 7 | 54 | 956488.8421 | 0.992584036 | 23074.77974 | 7960.653002 |
| 8 | 55 | 954304.1185 | 0.990316867 | 23022.07446 | 7942.470013 |
| 9 | 56 | 951956.4083 | 0.987880561 | 22965.43721 | 7922.930521 |
| 10 | 57 | 949446.8077 | 0.985276255 | 22904.89444 | 7902.043649 |
| 11 | 58 | 946777.6112 | 0.98250633 | 22840.50151 | 7879.828495 |
| 12 | 59 | 943952.9138 | 0.979575037 | 22772.3572 | 7856.31914 |
| 13 | 60 | 940980.5039 | 0.976490456 | 22700.64941 | 7831.580405 |
| 14 | 61 | 937867.7088 | 0.973260193 | 22625.5549 | 7805.673274 |
| 15 | 62 | 934622.2968 | 0.969892309 | 22547.26108 | 7778.662401 |
| 16 | 63 | 931000.1447 | 0.966133467 | 22459.87861 | 7748.516001 |
| 17 | 64 | 927038.3762 | 0.962022192 | 22364.30307 | 7715.543044 |
| 18 | 65 | 922780.6486 | 0.95760379 | 22261.58767 | 7680.106884 |
| 19 | 66 | 918297.02 | 0.952950962 | 22153.42254 | 7642.790598 |
| 20 | 67 | 913669.2962 | 0.948148601 | 22041.78119 | 7604.275038 |
| 21 | 68 | 908958.0915 | 0.943259608 | 21928.12591 | 7565.064684 |
| 22 | 69 | 904201.8612 | 0.938323891 | 21813.3844 | 7525.479592 |
| 23 | 70 | 899398.9753 | 0.933339758 | 21697.51736 | 7485.506195 |
| 24 | 71 | 894498.9555 | 0.928254826 | 21579.30701 | 7444.724374 |
| 25 | 72 | 889405.2781 | 0.922968927 | 21456.42478 | 7402.330781 |
| 26 | 73 | 884000.317 | 0.917359998 | 21326.033 | 7357.34644 |
| 27 | 74 | 878096.0989 | 0.911232971 | 21183.5969 | 7308.20689 |
| 28 | 75 | 871559.3418 | 0.904449535 | 21025.90115 | 7253.802852 |
| 29 | 76 | 864269.0364 | 0.896884114 | 20850.02645 | 7193.127193 |
| 30 | 77 | 856116.7951 | 0.88842423 | 20653.358 | 7125.277824 |
| 31 | 78 | 846958.6392 | 0.878920472 | 20432.42241 | 7049.056442 |
| 32 | 79 | 836670.0103 | 0.868243579 | 20184.21476 | 6963.426374 |
| 33 | 80 | 825062.2824 | 0.856197808 | 19904.18456 | 6866.817726 |
| 34 | 81 | 811916.6481 | 0.842556094 | 19587.05319 | 6757.40941 |
| 35 | 82 | 797084.273 | 0.827163987 | 19229.2301 | 6633.96271 |
| 36 | 83 | 780280.6643 | 0.809726258 | 18823.85207 | 6494.109852 |
| 37 | 84 | 761413.5494 | 0.790147151 | 18368.69305 | 6337.082871 |

## Annex 8

Excel calculations for the LoEC for a woman aged 50 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 446126.35 | 309038.8 | | | 441928.7219 | 292266.3288 | 734195.0507 |
| 3 | 50 | 27754.07 | | 973494.7154 | 1 | 27754.07 | 0 | |
| 4 | 51 | 27754.07 | | 972588.5336 | 0.999069146 | 27728.235 | 0 | |
| 5 | 52 | 27754.07 | | 971609.6268 | 0.998063586 | 27700.32664 | 0 | |
| 6 | 53 | 27754.07 | | 970556.1192 | 0.996981395 | 27670.29142 | 0 | |
| 7 | 54 | 27754.07 | | 969426.4712 | 0.99582099 | 27638.08546 | 0 | |
| 8 | 55 | 28713.98 | | 968221.984 | 0.994583708 | 28558.45671 | 0 | |
| 9 | 56 | 28713.98 | | 966946.1974 | 0.993273186 | 28520.82639 | 0 | |
| 10 | 57 | 28713.98 | | 965604.0767 | 0.991894523 | 28481.23951 | 0 | |
| 11 | 58 | 28713.98 | | 964203.0287 | 0.990455329 | 28439.91451 | 0 | |
| 12 | 59 | 28713.98 | | 962752.3411 | 0.988965144 | 28397.12536 | 0 | |
| 13 | 60 | 27390.57 | | 961261.3503 | 0.987433558 | 27046.36799 | 0 | |
| 14 | 61 | 27390.57 | | 959739.75 | 0.985870529 | 27003.55574 | 0 | |
| 15 | 62 | 27390.57 | | 958256.3652 | 0.984346756 | 26961.81873 | 0 | |
| 16 | 63 | 27390.57 | | 956544.1292 | 0.982587901 | 26913.64269 | 0 | |
| 17 | 64 | 27390.57 | | 954620.5393 | 0.980611938 | 26859.51993 | 0 | |
| 18 | 65 | 26833.25 | | 952525.0599 | 0.978459405 | 26255.24583 | 0 | |
| 19 | 66 | 0 | 16265.2 | 950313.4276 | 0.976187557 | 0 | 15877.88585 | |
| 20 | 67 | 0 | 16265.2 | 948032.0132 | 0.973844026 | 0 | 15839.76786 | |
| 21 | 68 | 0 | 16265.2 | 945695.1684 | 0.971443556 | 0 | 15800.72373 | |
| 22 | 69 | 0 | 16265.2 | 943293.0563 | 0.968976042 | 0 | 15760.58912 | |
| 23 | 70 | 0 | 16265.2 | 940811.9363 | 0.966427369 | 0 | 15719.13444 | |
| 24 | 71 | 0 | 16265.2 | 938225.4913 | 0.963770503 | 0 | 15675.91998 | |
| 25 | 72 | 0 | 16265.2 | 935519.2422 | 0.960990571 | 0 | 15630.70383 | |
| 26 | 73 | 0 | 16265.2 | 932678.9773 | 0.958072974 | 0 | 15583.24854 | |
| 27 | 74 | 0 | 16265.2 | 929641.5354 | 0.954952832 | 0 | 15532.4988 | |
| 28 | 75 | 0 | 16265.2 | 926358.0985 | 0.951579997 | 0 | 15477.63897 | |
| 29 | 76 | 0 | 16265.2 | 922765.0163 | 0.947889086 | 0 | 15417.60557 | |
| 30 | 77 | 0 | 16265.2 | 918782.0178 | 0.943797643 | 0 | 15351.05742 | |
| 31 | 78 | 0 | 16265.2 | 914291.5204 | 0.939184883 | 0 | 15276.02996 | |
| 32 | 79 | 0 | 16265.2 | 909186.3815 | 0.933940747 | 0 | 15190.73304 | |
| 33 | 80 | 0 | 16265.2 | 903331.8131 | 0.927926776 | 0 | 15092.9146 | |
| 34 | 81 | 0 | 16265.2 | 896560.6787 | 0.920971285 | 0 | 14979.78214 | |
| 35 | 82 | 0 | 16265.2 | 888714.8455 | 0.912911834 | 0 | 14848.69355 | |
| 36 | 83 | 0 | 16265.2 | 879527.9143 | 0.90347477 | 0 | 14695.19783 | |
| 37 | 84 | 0 | 16265.2 | 868814.8588 | 0.892470031 | 0 | 14516.20355 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 786155.2231 | 271218.5774 |
| 3 | 50 | 973494.7154 | 1 | 23247.18 | 8020.13 |
| 4 | 51 | 972588.5336 | 0.999069146 | 23225.54026 | 8012.664427 |
| 5 | 52 | 971609.6268 | 0.998063586 | 23202.16384 | 8004.59971 |
| 6 | 53 | 970556.1192 | 0.996981395 | 23177.00594 | 7995.920394 |
| 7 | 54 | 969426.4712 | 0.99582099 | 23150.0298 | 7986.613796 |
| 8 | 55 | 968221.984 | 0.994583708 | 23121.26649 | 7976.690637 |
| 9 | 56 | 966946.1974 | 0.993273186 | 23090.80054 | 7966.180076 |
| 10 | 57 | 965604.0767 | 0.991894523 | 23058.75053 | 7955.123024 |
| 11 | 58 | 964203.0287 | 0.990455329 | 23025.29332 | 7943.580499 |
| 12 | 59 | 962752.3411 | 0.988965144 | 22990.65071 | 7931.629018 |
| 13 | 60 | 961261.3503 | 0.987433558 | 22955.04566 | 7919.3455 |
| 14 | 61 | 959739.75 | 0.985870529 | 22918.70964 | 7906.809806 |
| 15 | 62 | 958256.3652 | 0.984346756 | 22883.28622 | 7894.58895 |
| 16 | 63 | 956544.1292 | 0.982587901 | 22842.39781 | 7880.482704 |
| 17 | 64 | 954620.5393 | 0.980611938 | 22796.46223 | 7864.635221 |
| 18 | 65 | 952525.0599 | 0.978459405 | 22746.42191 | 7847.371627 |
| 19 | 66 | 950313.4276 | 0.976187557 | 22693.60784 | 7829.151109 |
| 20 | 67 | 948032.0132 | 0.973844026 | 22639.12737 | 7810.355691 |
| 21 | 68 | 945695.1684 | 0.971443556 | 22583.32322 | 7791.10361 |
| 22 | 69 | 943293.0563 | 0.968976042 | 22525.96047 | 7771.313825 |
| 23 | 70 | 940811.9363 | 0.966427369 | 22466.711 | 7750.873134 |
| 24 | 71 | 938225.4913 | 0.963770503 | 22404.94636 | 7729.564723 |
| 25 | 72 | 935519.2422 | 0.960990571 | 22340.32078 | 7707.269307 |
| 26 | 73 | 932678.9773 | 0.958072974 | 22272.49489 | 7683.869803 |
| 27 | 74 | 929641.5354 | 0.954952832 | 22199.96038 | 7658.845857 |
| 28 | 75 | 926358.0985 | 0.951579997 | 22121.55148 | 7631.795283 |
| 29 | 76 | 922765.0163 | 0.947889086 | 22035.74821 | 7602.193698 |
| 30 | 77 | 918782.0178 | 0.943797643 | 21940.63369 | 7569.379791 |
| 31 | 78 | 914291.5204 | 0.939184883 | 21833.40003 | 7532.384857 |
| 32 | 79 | 909186.3815 | 0.933940747 | 21711.48865 | 7490.326202 |
| 33 | 80 | 903331.8131 | 0.927926776 | 21571.6808 | 7442.093378 |
| 34 | 81 | 896560.6787 | 0.920971285 | 21409.98523 | 7386.30943 |
| 35 | 82 | 888714.8455 | 0.912911834 | 21222.62572 | 7321.671583 |
| 36 | 83 | 879527.9143 | 0.90347477 | 21003.24061 | 7245.985109 |
| 37 | 84 | 868814.8588 | 0.892470031 | 20747.41146 | 7157.72567 |

## Annex 9

Excel calculations for the LoEC for a man aged 60 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 163786.1 | 325304 | | | 161937.179 | 288088.1789 | 450025.3579 |
| 3 | 60 | 27390.57 | | 918842.0608 | 1 | 27390.57 | 0 | |
| 4 | 61 | 27390.57 | | 915066.2647 | 0.995890702 | 27278.01398 | 0 | |
| 5 | 62 | 27390.57 | | 911137.0196 | 0.991614401 | 27160.88366 | 0 | |
| 6 | 63 | 27390.57 | | 906756.592 | 0.986847066 | 27030.30365 | 0 | |
| 7 | 64 | 27390.57 | | 901966.0467 | 0.98163339 | 26887.49807 | 0 | |
| 8 | 65 | 26833.25 | | 896812.3707 | 0.976024508 | 26189.90964 | 0 | |
| 9 | 66 | 0 | 16265.2 | 891373.017 | 0.970104717 | 0 | 15778.94724 | |
| 10 | 67 | 0 | 16265.2 | 885740.1239 | 0.963974291 | 0 | 15679.23463 | |
| 11 | 68 | 0 | 16265.2 | 879988.0938 | 0.957714205 | 0 | 15577.41309 | |
| 12 | 69 | 0 | 16265.2 | 874161.7919 | 0.951373287 | 0 | 15474.27679 | |
| 13 | 70 | 0 | 16265.2 | 868259.9899 | 0.944950201 | 0 | 15369.80401 | |
| 14 | 71 | 0 | 16265.2 | 862229.1599 | 0.93838669 | 0 | 15263.04719 | |
| 15 | 72 | 0 | 16265.2 | 855955.2054 | 0.93155858 | 0 | 15151.98662 | |
| 16 | 73 | 0 | 16265.2 | 849293.3919 | 0.924308353 | 0 | 15034.06022 | |
| 17 | 74 | 0 | 16265.2 | 842034.1581 | 0.916407938 | 0 | 14905.55839 | |
| 18 | 75 | 0 | 16265.2 | 834017.7778 | 0.9076835 | 0 | 14763.65367 | |
| 19 | 76 | 0 | 16265.2 | 825109.0442 | 0.897987891 | 0 | 14605.95264 | |
| 20 | 77 | 0 | 16265.2 | 815191.4241 | 0.887194284 | 0 | 14430.39247 | |
| 21 | 78 | 0 | 16265.2 | 804120.6712 | 0.875145692 | 0 | 14234.41971 | |
| 22 | 79 | 0 | 16265.2 | 791761.8522 | 0.861695264 | 0 | 14015.64581 | |
| 23 | 80 | 0 | 16265.2 | 777922.7733 | 0.84663383 | 0 | 13770.66858 | |
| 24 | 81 | 0 | 16265.2 | 762389.4678 | 0.829728525 | 0 | 13495.7004 | |
| 25 | 82 | 0 | 16265.2 | 745030.4102 | 0.810836206 | 0 | 13188.41305 | |
| 26 | 83 | 0 | 16265.2 | 725608.2794 | 0.78969859 | 0 | 12844.6055 | |
| 27 | 84 | 0 | 16265.2 | 704070.2171 | 0.766258149 | 0 | 12463.34205 | |
| 28 | 85 | 0 | 16265.2 | 680214.7835 | 0.740295653 | 0 | 12041.05686 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | Ix hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 549655.0665 | 189627.5199 |
| 3 | 60 | 918842.0608 | 1 | 23247.18 | 8020.13 |
| 4 | 61 | 915066.2647 | 0.995890702 | 23151.6504 | 7987.172894 |
| 5 | 62 | 911137.0196 | 0.991614401 | 23052.23847 | 7952.876405 |
| 6 | 63 | 906756.592 | 0.986847066 | 22941.41138 | 7914.641761 |
| 7 | 64 | 901966.0467 | 0.98163339 | 22820.2081 | 7872.827397 |
| 8 | 65 | 896812.3707 | 0.976024508 | 22689.81743 | 7827.843441 |
| 9 | 66 | 891373.017 | 0.970104717 | 22552.19897 | 7780.365941 |
| 10 | 67 | 885740.1239 | 0.963974291 | 22409.68385 | 7731.199129 |
| 11 | 68 | 879988.0938 | 0.957714205 | 22264.15451 | 7680.992427 |
| 12 | 69 | 874161.7919 | 0.951373287 | 22116.74606 | 7630.137443 |
| 13 | 70 | 868259.9899 | 0.944950201 | 21967.42741 | 7578.623454 |
| 14 | 71 | 862229.1599 | 0.93838669 | 21814.84429 | 7525.983243 |
| 15 | 72 | 855955.2054 | 0.93155858 | 21656.10999 | 7471.220914 |
| 16 | 73 | 849293.3919 | 0.924308353 | 21487.56266 | 7413.073152 |
| 17 | 74 | 842034.1581 | 0.916407938 | 21303.90028 | 7349.710794 |
| 18 | 75 | 834017.7778 | 0.9076835 | 21101.08171 | 7279.73967 |
| 19 | 76 | 825109.0442 | 0.897987891 | 20875.68614 | 7201.979624 |
| 20 | 77 | 815191.4241 | 0.887194284 | 20624.76521 | 7115.413492 |
| 21 | 78 | 804120.6712 | 0.875145692 | 20344.66943 | 7018.78222 |
| 22 | 79 | 791761.8522 | 0.861695264 | 20031.98491 | 6910.908038 |
| 23 | 80 | 777922.7733 | 0.84663383 | 19681.84905 | 6790.113381 |
| 24 | 81 | 762389.4678 | 0.829728525 | 19288.84837 | 6654.530635 |
| 25 | 82 | 745030.4102 | 0.810836206 | 18849.65523 | 6503.011779 |
| 26 | 83 | 725608.2794 | 0.78969859 | 18358.26526 | 6333.485349 |
| 27 | 84 | 704070.2171 | 0.766258149 | 17813.34113 | 6145.489972 |
| 28 | 85 | 680214.7835 | 0.740295653 | 17209.7863 | 5937.267377 |

## Annex 10

Excel calculations for the LoEC for a woman aged 60 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 163786.1 | 325304 | | | 162930.2825 | 306124.2527 | 469054.5353 |
| 3 | 60 | 27390.57 | | 947507.9003 | 1 | 27390.57 | 0 | |
| 4 | 61 | 27390.57 | | 945683.2853 | 0.998074301 | 27337.82401 | 0 | |
| 5 | 62 | 27390.57 | | 943893.2563 | 0.996185104 | 27286.07783 | 0 | |
| 6 | 63 | 27390.57 | | 941812.6481 | 0.99398923 | 27225.93158 | 0 | |
| 7 | 64 | 27390.57 | | 939457.6247 | 0.991503738 | 27157.85254 | 0 | |
| 8 | 65 | 26833.25 | | 936871.4106 | 0.988774247 | 26532.02656 | 0 | |
| 9 | 66 | 0 | 16265.2 | 934118.1637 | 0.98586847 | 0 | 16035.34783 | |
| 10 | 67 | 0 | 16265.2 | 931251.8165 | 0.982843326 | 0 | 15986.14327 | |
| 11 | 68 | 0 | 16265.2 | 928290.3926 | 0.979717839 | 0 | 15935.3066 | |
| 12 | 69 | 0 | 16265.2 | 925219.2694 | 0.976476575 | 0 | 15882.58679 | |
| 13 | 70 | 0 | 16265.2 | 922019.4044 | 0.973099437 | 0 | 15827.65696 | |
| 14 | 71 | 0 | 16265.2 | 918659.5434 | 0.969553439 | 0 | 15769.9806 | |
| 15 | 72 | 0 | 16265.2 | 915121.5766 | 0.965819468 | 0 | 15709.24682 | |
| 16 | 73 | 0 | 16265.2 | 911385.241 | 0.961876139 | 0 | 15645.10778 | |
| 17 | 74 | 0 | 16265.2 | 907378.2656 | 0.957647177 | 0 | 15576.32286 | |
| 18 | 75 | 0 | 16265.2 | 903037.2022 | 0.953065618 | 0 | 15501.80288 | |
| 19 | 76 | 0 | 16265.2 | 898284.6597 | 0.948049784 | 0 | 15420.21934 | |
| 20 | 77 | 0 | 16265.2 | 893024.071 | 0.942497757 | 0 | 15329.91452 | |
| 21 | 78 | 0 | 16265.2 | 887119.7434 | 0.936266329 | 0 | 15228.55909 | |
| 22 | 79 | 0 | 16265.2 | 880444.8583 | 0.929221654 | 0 | 15113.97605 | |
| 23 | 80 | 0 | 16265.2 | 872849.7773 | 0.921205804 | 0 | 14983.59665 | |
| 24 | 81 | 0 | 16265.2 | 864153.5022 | 0.912027754 | 0 | 14834.31382 | |
| 25 | 82 | 0 | 16265.2 | 854189.4568 | 0.901511699 | 0 | 14663.26808 | |
| 26 | 83 | 0 | 16265.2 | 842687.4133 | 0.88937244 | 0 | 14465.82061 | |
| 27 | 84 | 0 | 16265.2 | 829462.1032 | 0.875414446 | 0 | 14238.79104 | |
| 28 | 85 | 0 | 16265.2 | 814170.5142 | 0.8592757 | 0 | 13976.29112 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | Ix mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 576282.1904 | 198813.7092 |
| 3 | 60 | 947507.9003 | 1 | 23247.18 | 8020.13 |
| 4 | 61 | 945683.2853 | 0.998074301 | 23202.41293 | 8004.685645 |
| 5 | 62 | 943893.2563 | 0.996185104 | 23158.49443 | 7989.53404 |
| 6 | 63 | 941812.6481 | 0.99398923 | 23107.44655 | 7971.922843 |
| 7 | 64 | 939457.6247 | 0.991503738 | 23049.66586 | 7951.988873 |
| 8 | 65 | 936871.4106 | 0.988774247 | 22986.2129 | 7930.098001 |
| 9 | 66 | 934118.1637 | 0.98586847 | 22918.66177 | 7906.793291 |
| 10 | 67 | 931251.8165 | 0.982843326 | 22848.33572 | 7882.531247 |
| 11 | 68 | 928290.3926 | 0.979717839 | 22775.67696 | 7857.464433 |
| 12 | 69 | 925219.2694 | 0.976476575 | 22700.32671 | 7831.469075 |
| 13 | 70 | 922019.4044 | 0.973099437 | 22621.81777 | 7804.383989 |
| 14 | 71 | 918659.5434 | 0.969553439 | 22539.38332 | 7775.944625 |
| 15 | 72 | 915121.5766 | 0.965819468 | 22452.57903 | 7745.997693 |
| 16 | 73 | 911385.241 | 0.961876139 | 22360.90775 | 7714.371681 |
| 17 | 74 | 907378.2656 | 0.957647177 | 22262.59629 | 7680.454852 |
| 18 | 75 | 903037.2022 | 0.953065618 | 22156.08797 | 7643.710152 |
| 19 | 76 | 898284.6597 | 0.948049784 | 22039.48397 | 7603.48251 |
| 20 | 77 | 893024.071 | 0.942497757 | 21910.41501 | 7558.954539 |
| 21 | 78 | 887119.7434 | 0.936266329 | 21765.55188 | 7508.977673 |
| 22 | 79 | 880444.8583 | 0.929221654 | 21601.78305 | 7452.478464 |
| 23 | 80 | 872849.7773 | 0.921205804 | 21415.43715 | 7388.190307 |
| 24 | 81 | 864153.5022 | 0.912027754 | 21202.07336 | 7314.581151 |
| 25 | 82 | 854189.4568 | 0.901511699 | 20957.60473 | 7230.241021 |
| 26 | 83 | 842687.4133 | 0.88937244 | 20675.4012 | 7132.882589 |
| 27 | 84 | 829462.1032 | 0.875414446 | 20350.91719 | 7020.937658 |
| 28 | 85 | 814170.5142 | 0.8592757 | 19975.73687 | 6891.50282 |

## Annex 11

Excel calculations for the LoEC for a man aged 70 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 0 | 276508.4 | | | 0 | 244882.5577 | 244882.5577 |
| 3 | 70 | 0 | 16265.2 | 827392.8013 | 1 | 0 | 16265.2 | |
| 4 | 71 | 0 | 16265.2 | 820065.8908 | 0.99114458 | 0 | 16121.16483 | |
| 5 | 72 | 0 | 16265.2 | 812440.9852 | 0.981928999 | 0 | 15971.27156 | |
| 6 | 73 | 0 | 16265.2 | 804342.91 | 0.972141538 | 0 | 15812.07654 | |
| 7 | 74 | 0 | 16265.2 | 795544.6387 | 0.961507808 | 0 | 15639.1168 | |
| 8 | 75 | 0 | 16265.2 | 785858.7056 | 0.949801236 | 0 | 15448.70707 | |
| 9 | 76 | 0 | 16265.2 | 775139.1438 | 0.936845405 | 0 | 15237.97788 | |
| 10 | 77 | 0 | 16265.2 | 763266.5984 | 0.922496059 | 0 | 15004.5829 | |
| 11 | 78 | 0 | 16265.2 | 750107.1904 | 0.906591391 | 0 | 14745.89029 | |
| 12 | 79 | 0 | 16265.2 | 735521.0792 | 0.888962386 | 0 | 14459.15101 | |
| 13 | 80 | 0 | 16265.2 | 719324.3497 | 0.869386764 | 0 | 14140.74959 | |
| 14 | 81 | 0 | 16265.2 | 701323.8423 | 0.847631066 | 0 | 13786.88882 | |
| 15 | 82 | 0 | 16265.2 | 681420.8735 | 0.823576024 | 0 | 13395.62874 | |
| 16 | 83 | 0 | 16265.2 | 659454.2725 | 0.797026843 | 0 | 12963.80101 | |
| 17 | 84 | 0 | 16265.2 | 635425.0987 | 0.767984804 | 0 | 12491.42644 | |
| 18 | 85 | 0 | 16265.2 | 609248.2928 | 0.736347104 | 0 | 11976.83291 | |
| 19 | 86 | 0 | 16265.2 | 581029.2008 | 0.702241064 | 0 | 11422.09135 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | Ix hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 350000.5471 | 120747.9741 |
| 3 | 70 | 827392.8013 | 1 | 23247.18 | 8020.13 |
| 4 | 71 | 820065.8908 | 0.99114458 | 23041.31646 | 7949.108383 |
| 5 | 72 | 812440.9852 | 0.981928999 | 22827.08019 | 7875.198223 |
| 6 | 73 | 804342.91 | 0.972141538 | 22599.54931 | 7796.701509 |
| 7 | 74 | 795544.6387 | 0.961507808 | 22352.34508 | 7711.417616 |
| 8 | 75 | 785858.7056 | 0.949801236 | 22080.20031 | 7617.52939 |
| 9 | 76 | 775139.1438 | 0.936845405 | 21779.01376 | 7513.621936 |
| 10 | 77 | 763266.5984 | 0.922496059 | 21445.43193 | 7398.538318 |
| 11 | 78 | 750107.1904 | 0.906591391 | 21075.69325 | 7270.98081 |
| 12 | 79 | 735521.0792 | 0.888962386 | 20665.86861 | 7129.593904 |
| 13 | 80 | 719324.3497 | 0.869386764 | 20210.79058 | 6972.594864 |
| 14 | 81 | 701323.8423 | 0.847631066 | 19705.03197 | 6798.111342 |
| 15 | 82 | 681420.8735 | 0.823576024 | 19145.82007 | 6605.186776 |
| 16 | 83 | 659454.2725 | 0.797026843 | 18528.62649 | 6392.258896 |
| 17 | 84 | 635425.0987 | 0.767984804 | 17853.48099 | 6159.33797 |
| 18 | 85 | 609248.2928 | 0.736347104 | 17117.99366 | 5905.599496 |
| 19 | 86 | 581029.2008 | 0.702241064 | 16325.12441 | 5632.064622 |

## Annex 12

Excel calculations for the LoEC for a woman aged 70 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | Ix mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 0 | 276508.4 | | | 0 | 258784.0839 | 258784.0839 |
| 3 | 70 | 0 | 16265.2 | 896882.1393 | 1 | 0 | 16265.2 | |
| 4 | 71 | 0 | 16265.2 | 892550.0496 | 0.995169834 | 0 | 16186.63638 | |
| 5 | 72 | 0 | 16265.2 | 887960.4967 | 0.990052603 | 0 | 16103.4036 | |
| 6 | 73 | 0 | 16265.2 | 883084.9684 | 0.984616517 | 0 | 16014.98458 | |
| 7 | 74 | 0 | 16265.2 | 877843.4628 | 0.978772376 | 0 | 15919.92846 | |
| 8 | 75 | 0 | 16265.2 | 872154.6789 | 0.972429532 | 0 | 15816.76082 | |
| 9 | 76 | 0 | 16265.2 | 865926.7162 | 0.965485517 | 0 | 15703.81504 | |
| 10 | 77 | 0 | 16265.2 | 859046.4879 | 0.957814244 | 0 | 15579.04024 | |
| 11 | 78 | 0 | 16265.2 | 851363.1617 | 0.949247537 | 0 | 15439.70104 | |
| 12 | 79 | 0 | 16265.2 | 842731.0891 | 0.939623003 | 0 | 15283.15607 | |
| 13 | 80 | 0 | 16265.2 | 832992.2421 | 0.928764445 | 0 | 15106.53945 | |
| 14 | 81 | 0 | 16265.2 | 821961.2555 | 0.916465185 | 0 | 14906.48952 | |
| 15 | 82 | 0 | 16265.2 | 809473.581 | 0.902541756 | 0 | 14680.02217 | |
| 16 | 83 | 0 | 16265.2 | 795275.2843 | 0.886711029 | 0 | 14422.53222 | |
| 17 | 84 | 0 | 16265.2 | 779193.5652 | 0.868780335 | 0 | 14130.8859 | |
| 18 | 85 | 0 | 16265.2 | 760924.7541 | 0.848411091 | 0 | 13799.57607 | |
| 19 | 86 | 0 | 16265.2 | 740292.9303 | 0.82540715 | 0 | 13425.41237 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | Ix mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 369869.4255 | 127602.6114 |
| 3 | 70 | 896882.1393 | 1 | 23247.18 | 8020.13 |
| 4 | 71 | 892550.0496 | 0.995169834 | 23134.89226 | 7981.39144 |
| 5 | 72 | 887960.4967 | 0.990052603 | 23015.93108 | 7940.350584 |
| 6 | 73 | 883084.9684 | 0.984616517 | 22889.55741 | 7896.752469 |
| 7 | 74 | 877843.4628 | 0.978772376 | 22753.69761 | 7849.881699 |
| 8 | 75 | 872154.6789 | 0.972429532 | 22606.24437 | 7799.011262 |
| 9 | 76 | 865926.7162 | 0.965485517 | 22444.81561 | 7743.319362 |
| 10 | 77 | 859046.4879 | 0.957814244 | 22266.48013 | 7681.794751 |
| 11 | 78 | 851363.1617 | 0.949247537 | 22067.32836 | 7613.088649 |
| 12 | 79 | 842731.0891 | 0.939623003 | 21843.58508 | 7535.898636 |
| 13 | 80 | 832992.2421 | 0.928764445 | 21591.15423 | 7448.811587 |
| 14 | 81 | 821961.2555 | 0.916465185 | 21305.23111 | 7350.169922 |
| 15 | 82 | 809473.581 | 0.902541756 | 20981.55066 | 7238.502214 |
| 16 | 83 | 795275.2843 | 0.886711029 | 20613.53089 | 7111.537723 |
| 17 | 84 | 779193.5652 | 0.868780335 | 20196.69282 | 6967.731226 |
| 18 | 85 | 760924.7541 | 0.848411091 | 19723.16534 | 6804.367242 |
| 19 | 86 | 740292.9303 | 0.82540715 | 19188.38858 | 6619.872644 |

## Annex 13

Excel calculations for the LoEC for a man aged 80 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 0 | 162652 | | | 0 | 134213.0167 | 134213.0167 |
| 3 | 80 | 0 | 16265.2 | 647679.3237 | 1 | 0 | 16265.2 | |
| 4 | 81 | 0 | 16265.2 | 627367.3276 | 0.968638807 | 0 | 15755.10393 | |
| 5 | 82 | 0 | 16265.2 | 605176.6196 | 0.934376932 | 0 | 15197.82768 | |
| 6 | 83 | 0 | 16265.2 | 581052.3528 | 0.897129693 | 0 | 14591.99388 | |
| 7 | 84 | 0 | 16265.2 | 555061.5815 | 0.857000619 | 0 | 13939.28647 | |
| 8 | 85 | 0 | 16265.2 | 527259.6861 | 0.814075217 | 0 | 13241.09622 | |
| 9 | 86 | 0 | 16265.2 | 497851.1391 | 0.768669187 | 0 | 12502.55806 | |
| 10 | 87 | 0 | 16265.2 | 466819.5158 | 0.720757169 | 0 | 11723.25951 | |
| 11 | 88 | 0 | 16265.2 | 434557.842 | 0.670945985 | 0 | 10913.07064 | |
| 12 | 89 | 0 | 16265.2 | 401529.1767 | 0.619950587 | 0 | 10083.62028 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 191825.1332 | 66178.45716 |
| 3 | 80 | 647679.3237 | 1 | 23247.18 | 8020.13 |
| 4 | 81 | 627367.3276 | 0.968638807 | 22518.12071 | 7768.609157 |
| 5 | 82 | 605176.6196 | 0.934376932 | 21721.62873 | 7493.824465 |
| 6 | 83 | 581052.3528 | 0.897129693 | 20855.73545 | 7195.096764 |
| 7 | 84 | 555061.5815 | 0.857000619 | 19922.84765 | 6873.256376 |
| 8 | 85 | 527259.6861 | 0.814075217 | 18924.95311 | 6528.989071 |
| 9 | 86 | 497851.1391 | 0.768669187 | 17869.39095 | 6164.826805 |
| 10 | 87 | 466819.5158 | 0.720757169 | 16755.57164 | 5780.566194 |
| 11 | 88 | 434557.842 | 0.670945985 | 15597.60209 | 5381.074024 |
| 12 | 89 | 401529.1767 | 0.619950587 | 14412.10288 | 4972.084299 |

## Annex 14

Excel calculations for the LoEC for a woman aged 80 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 0 | 162652 | | | 0 | 144914.6965 | 144914.6965 |
| 3 | 80 | 0 | 16265.2 | 781373.2911 | 1 | 0 | 16265.2 | |
| 4 | 81 | 0 | 16265.2 | 767619.8428 | 0.982398364 | 0 | 15978.90587 | |
| 5 | 82 | 0 | 16265.2 | 752253.8071 | 0.962732942 | 0 | 15659.04384 | |
| 6 | 83 | 0 | 16265.2 | 735066.3856 | 0.940736513 | 0 | 15301.26754 | |
| 7 | 84 | 0 | 16265.2 | 715914.2511 | 0.916225649 | 0 | 14902.59343 | |
| 8 | 85 | 0 | 16265.2 | 694567.3523 | 0.88890593 | 0 | 14458.23274 | |
| 9 | 86 | 0 | 16265.2 | 670922.1798 | 0.858644885 | 0 | 13966.03079 | |
| 10 | 87 | 0 | 16265.2 | 644553.4663 | 0.824898257 | 0 | 13417.13514 | |
| 11 | 88 | 0 | 16265.2 | 615476.6568 | 0.787685814 | 0 | 12811.8673 | |
| 12 | 89 | 0 | 16265.2 | 583893.1601 | 0.747265317 | 0 | 12154.41983 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 207120.6031 | 71455.29749 |
| 3 | 80 | 781373.2911 | 1 | 23247.18 | 8020.13 |
| 4 | 81 | 767619.8428 | 0.982398364 | 22837.9916 | 7878.96259 |
| 5 | 82 | 752253.8071 | 0.962732942 | 22380.82599 | 7721.243347 |
| 6 | 83 | 735066.3856 | 0.940736513 | 21869.47106 | 7544.829133 |
| 7 | 84 | 715914.2511 | 0.916225649 | 21299.66259 | 7348.248818 |
| 8 | 85 | 694567.3523 | 0.88890593 | 20664.55617 | 7129.141119 |
| 9 | 86 | 670922.1798 | 0.858644885 | 19961.0722 | 6886.443603 |
| 10 | 87 | 644553.4663 | 0.824898257 | 19176.55827 | 6615.791261 |
| 11 | 88 | 615476.6568 | 0.787685814 | 18311.4739 | 6317.342627 |
| 12 | 89 | 583893.1601 | 0.747265317 | 17371.81133 | 5993.164987 |

## Annex 15

Excel calculations for the LoEC for a man aged 90 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx hombres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 0 | 81326 | | | 0 | 65443.14458 | 65443.14458 |
| 3 | 90 | 0 | 16265.2 | 284943.7293 | 1 | 0 | 16265.2 | |
| 4 | 91 | 0 | 16265.2 | 255830.97 | 0.897829795 | 0 | 14603.38117 | |
| 5 | 92 | 0 | 16265.2 | 228020.9859 | 0.800231633 | 0 | 13015.92756 | |
| 6 | 93 | 0 | 16265.2 | 201492.0763 | 0.707129358 | 0 | 11501.60043 | |
| 7 | 94 | 0 | 16265.2 | 176185.3022 | 0.618316124 | 0 | 10057.03542 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx hombres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 93535.18935 | 32269.04847 |
| 3 | 90 | 284943.7293 | 1 | 23247.18 | 8020.13 |
| 4 | 91 | 255830.97 | 0.897829795 | 20872.01084 | 7200.71167 |
| 5 | 92 | 228020.9859 | 0.800231633 | 18603.12882 | 6417.961728 |
| 6 | 93 | 201492.0763 | 0.707129358 | 16438.76346 | 5671.269375 |
| 7 | 94 | 176185.3022 | 0.618316124 | 14374.10623 | 4958.975694 |

## Annex 16

Excel calculations for the LoEC for a woman aged 90 with a score of 80.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Edad | Salario | Pensión | lx mujeres | tpx | VA Salario | VA Pensión | DEJA DE INGRESAR |
| 2 | TOTAL | 0 | 81326 | | | 0 | 69177.3767 | 69177.3767 |
| 3 | 90 | 0 | 16265.2 | 479959.1496 | 1 | 0 | 16265.2 | |
| 4 | 91 | 0 | 16265.2 | 444624.2962 | 0.926379456 | 0 | 15067.74714 | |
| 5 | 92 | 0 | 16265.2 | 408516.3634 | 0.851148194 | 0 | 13844.09561 | |
| 6 | 93 | 0 | 16265.2 | 372154.4876 | 0.775387839 | 0 | 12611.83827 | |
| 7 | 94 | 0 | 16265.2 | 336055.6713 | 0.70017557 | 0 | 11388.49569 | |

| | A | D | E | I | J |
|---|---|---|---|---|---|
| 1 | Edad | lx mujeres | tpx | VA Prestaciones | VA Coste Residencia |
| 2 | TOTAL | | | 98872.37341 | 34110.3432 |
| 3 | 90 | 479959.1496 | 1 | 23247.18 | 8020.13 |
| 4 | 91 | 444624.2962 | 0.926379456 | 21535.70997 | 7429.68367 |
| 5 | 92 | 408516.3634 | 0.851148194 | 19786.79527 | 6826.319166 |
| 6 | 93 | 372154.4876 | 0.775387839 | 18025.58065 | 6218.711265 |
| 7 | 94 | 336055.6713 | 0.70017557 | 16277.10751 | 5615.499097 |

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