**Appendix I – Supplementary tables**

Table S1 - Fertility rates and number of women in the several age groups, in the Portuguese population, based on data from the Portuguese National Statistics Institute, 2018.

|  |  |  |
| --- | --- | --- |
| **Age group** | **Fertility rate (1)** | **Women population (2)** |
| 15 - 19 | 7.78 | 270414 |
| 20 - 24 | 32.68 | 265978 |
| 25 - 29 | 69.47 | 274710 |
| 30 - 34 | 96.25 | 293745 |
| 35 - 39 | 61.13 | 357170 |
| 40 - 44 | 14.26 | 419405 |
| 45 - 49 | 0.98 | 406993 |
|  |  |  |
| (1) Reference: (Instituto Nacional de Estatística, 2019c) |
| (2) Reference: (Instituto Nacional de Estatística, 2019b) |
|  |  |  |

Table S2 - CHD mortality data for DALYs estimation, based on data from the Portuguese National Statistics Institute, 2017.

|  |  |  |  |
| --- | --- | --- | --- |
| **Age group** | **Mortality – Rate/100k (1)** | **Total population (2)** | **Mortality – Number of deaths** |
| 15 - 24 | 0.5 | 1093201 | 5.5 |
| 25 - 34 | 1.7 | 1141267 | 19.4 |
| 35 - 44 | 7.4 | 1516971 | 112.3 |
| 45 - 54 | 25.2 | 1520758 | 383.2 |
| 55 - 64 | 52.2 | 1381660 | 721.2 |
| 65 - 74 | 108 | 1141389 | 1232.7 |
| ≥75 | 445.3 | 1071885 | 4773.1 |
|  |  |  |  |
| (1) Reference: (Instituto Nacional de Estatística, 2019d) |
| (2) Reference: (Instituto Nacional de Estatística, 2019b) |
|  |  |  |  |

Table S3 - Colorectal cancer incidence and mortality data for DALYs estimation, retrieved from IARC (Bray et al., 2018; Ferlay et al., 2018, 2019).

|  |  |  |
| --- | --- | --- |
| **Age group** | **Incidence – Number of cases** | **Mortality – Number of deaths** |
| 15-19 | 3 | 0 |
| 20-39 | 77 | 26 |
| 40-54 | 1014 | 243 |
| 55-69 | 3466 | 958 |
| 70+ | 5710 | 3034 |

Table S4 - Life expectancy at age χ (RLE), in the Portuguese population, in years, in 2018 (Instituto Nacional de Estatística, 2019a).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Age** | **RLE** | **Age** | **RLE** | **Age** | **RLE** | **Age** | **RLE** |
| **0** | **80.8** |  |  |  |  |  |  |
| 1 | 80.04 | 26 | 55.34 | 51 | 31.47 | 76 | 10.94 |
| 2 | 79.06 | 27 | 54.36 | 52 | 30.58 | 77 | 10.23 |
| 3 | 78.07 | 28 | 53.38 | 53 | 29.69 | 78 | 9.54 |
| 4 | 77.08 | 29 | 52.4 | 54 | 28.81 | 79 | 8.86 |
| 5 | 76.08 | 30 | 51.43 | 55 | 27.93 | 80 | 8.21 |
| 6 | 75.09 | 31 | 50.45 | 56 | 27.06 | 81 | 7.57 |
| 7 | 74.1 | 32 | 49.48 | 57 | 26.19 | 82 | 6.95 |
| 8 | 73.11 | 33 | 48.5 | 58 | 25.33 | 83 | 6.34 |
| 9 | 72.11 | 34 | 47.52 | 59 | 24.47 | 84 | 5.76 |
| 10 | 71.12 | 35 | 46.55 | 60 | 23.63 | 85 | 5.22 |
| 11 | 70.12 | 36 | 45.58 | 61 | 22.79 | 86 | 4.74 |
| 12 | 69.13 | 37 | 44.61 | 62 | 21.96 | 87 | 4.29 |
| 13 | 68.14 | 38 | 43.65 | 63 | 21.13 | 88 | 3.89 |
| 14 | 67.14 | 39 | 42.68 | 64 | 20.31 | 89 | 3.52 |
| 15 | 66.15 | 40 | 41.72 | 65 | 19.49 | 90 | 3.18 |
| 16 | 65.16 | 41 | 40.77 | 66 | 18.67 | 91 | 2.88 |
| 17 | 64.17 | 42 | 39.81 | 67 | 17.85 | 92 | 2.6 |
| 18 | 63.18 | 43 | 38.87 | 68 | 17.05 | 93 | 2.35 |
| 19 | 62.2 | 44 | 37.92 | 69 | 16.25 | 94 | 2.13 |
| 20 | 61.22 | 45 | 36.98 | 70 | 15.47 | 95 | 1.93 |
| 21 | 60.24 | 46 | 36.05 | 71 | 14.69 | 96 | 1.74 |
| 22 | 59.26 | 47 | 35.12 | 72 | 13.91 | 97 | 1.58 |
| 23 | 58.28 | 48 | 34.19 | 73 | 13.15 | 98 | 1.43 |
| 24 | 57.3 | 49 | 33.28 | 74 | 12.4 | 99 | 1.3 |
| 25 | 56.32 | 50 | 32.37 | 75 | 11.67 | 100 | 1.18 |

Table S5 - Disability weights (DW) used in the RBA model and respective 95% confidence interval, retrieved from GBD 2017 study (IHME, 2018).

|  |  |
| --- | --- |
| **Health Effect / Disability** | **DW (95% CI)** |
| *IQ: Intellectual Disability* |  |
|  Profound, IQ < 20 | 0.200 (0.133-0.283) |
|  Severe, IQ: 20-34 | 0.160 (0.107-0.226) |
|  Moderate, IQ: 35-49 | 0.100 (0.066-0.142) |
|  Mild, IQ: 50-69 | 0.043 (0.026-0.064) |
|  Borderline intellectual functioning, IQ: 70-84 | 0.011 (0.005-0.020) |
|  |  |
| *CRC: Cancer* |  |
|  Diagnosis and primary therapy | 0.288 (0.193-0.399) |
|  Metastatic | 0.451 (0.307-0.600) |
|  Terminal phase, with medication | 0.540 (0.377-0.687) |
|  Stoma | 0.095 (0.063-0.131) |
|  Remission (Controlled phase) | 0.049 (0.031-0.072) |
|  |  |

Table S6 - Duration of cancer stages used in the RBA, based on the Soerjomataram study (Soerjomataram et al., 2012).

|  |  |
| --- | --- |
| **Cancer stage** | **Duration (years)** |
| Diagnosis and Treatment (LD) | 1.08 |
| Remission: Death (LRD) | 0.19 |
| Remission: Cure (LRC) | 5.40 |
| Preterminal/Metastatic (LM) | 0.25 |
| Terminal (LT) | 0.08 |
| Sequelae (stoma) | *RLE-Cancer average age-* LD |

Table S7 - Summary of the probabilistic model inputs and distributions used in the RBA.

|  |  |
| --- | --- |
| **Model and input parameters** | **Description** |
| *Foetal neurodevelopment* |
| * $∆IQ\_{MeHg}=r\_{IQ,MeHg}∙I\_{MeH,a}$
* $∆IQ\_{DHA} =r\_{IQ,DHA}∙I\_{DHA}$
 | Dose-response equations describing change in newborn children’s IQ due to:* maternal MeHg exposure;
* maternal DHA exposure.
 |
| * $r\_{IQ,MeHg}\~ PERT\left(-1.5,-8.5,-19.5\right)$
* $r\_{IQ,DHA}\~PERT\left(0.85, 1.3, 1.74\right)$
 | IQ change per µg maternal MeHg/kg bw/day and per g maternal DHA. |
| * $I\_{MeHg}\_{i} \~ Gamma\left(α\_{i}\_{1},β\_{i}\_{1}\right)$
* $I\_{DHA}\_{i} \~ Gamma\left(α\_{i}\_{2},β\_{i}\_{2}\right)$
 | Maternal mean daily MeHg exposure in µg/kg bw/day, and DHA intake in g/day, for scenario *i*. |
| * $IQ \~ N(100,15^{2})$
 | IQ distribution in the population: normal distribution with average 100 and SD 15. |
| * $L\_{IQ}=LifeExpectancy\_{a=0}=80.8$
 | Duration of this HE (IQ) is defined as the life expectancy at birth (*a = 0*), weighted by the number of children born in Portugal in 2018. |
| *Coronary heart disease (CHD) mortality* |
| * $RR\_{CHD}=m\_{CHD}∙I\_{DHA+EPA,}+1$
* $RR\_{CHD}\~N\left(0.845, 0.0326^{2}\right)$
 | Dose-response relationship describing change in risk of fatal CHD ($m\_{CHD}$) due to DHA and EPA intake. |
| * $I\_{DHA+EPA}\_{i} \~ emp\left(α\_{i},β\_{i}\right)$
 | Mean daily intake of DHA and EPA in mg/day for scenario *i*. Describes variability.  |
| * $L\_{CHD}=0$
 | The duration of fatal CHD is set to zero since we assume immediate death. |
| *Colorectal cancer (CRC)* |
| * $RR\_{CRC}=m\_{CRC,red}∙I\_{red}+1$
* $RR\_{CRC,red} \~ PERT\left(1.05,1.17,1.31\right)$
* $RR\_{CRC}=m\_{CRC,proc}∙I\_{proc}+1$
* $RR\_{CRC,red} \~ PERT\left(1.10,1.18,1.28\right)$
 | Dose-response relationship describing change in risk of CRC ($m\_{CRC}$) due to consumption of:* 100 g of red meat (*red*);
* 50g of processed meat (*proc*).
 |
| * $I\_{red}\_{i} \~ emp\left(α\_{i}\_{1},β\_{i}\_{1}\right)$
* $I\_{proc}\_{i} \~ emp\left(α\_{i}\_{2},β\_{i}\_{2}\right)$
 | Mean daily intake of red and processed meat in g/day for scenario *i*. |
| * $L\_{CRC}$
 | The duration of CRC is dependent on the course of disease. The duration of each stage of CRC, considered in the CRC natural history model are presented in Table S6. |

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