Material suplementario

La ecuación ERICE: la nueva ecuación autóctona de riesgo cardiovascular para una población mediterránea envejecida y de bajo riesgo en España

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CALCULATION OF 10-YEAR RISK ESTIMATES FOR CARDIOVASCULAR DISEASE

Step 1

Calculate the underlying risk factors for CVD events (fatal and nonfatal) using a bivariate analysis. Of the originally entered variables that were selected based on theoretical information, the nonsignificant ones (estimated $p > .05$) were dropped from consideration.

Step 2

Cox proportional-hazard regressions analyzing the effect of the selected risk factors on survival were carried out. Cox models were adjusted by study source. Separate hazard functions for males and females were performed. The risk factors were introduced as stratified variables because analysis of heterogeneity was positive.

Cox models stratified by age ≤ 70 years or > 70 years were tested and C-statistic showed a good discriminative power (C statistic > 0.80). However, the model by event and sex reported a better estimation of the risk probabilities in the score calculation (C statistic > 0.78). Omnibus test was used to validate the model ($P < .05$). The C statistic, which is equivalent to areas under receiver operator characteristic (ROC) curves, is a measure of discrimination that estimates the ability of a predictive model to differentiate individuals who experience an event from those who did not.

Step 3

Weighted sums for men and women are calculated. The sums ($\Sigma \beta_i x_i$) are obtained replacing β_i by the β-coefficients obtained in the Cox regression models for each evaluated risk factor (coefficients in tables 3 for men and in table 4 for women), and replacing x_i by "1" when the risk factor is present or "0" when it is not.

Step 4

Survival is defined as the proportion of patients living for a certain amount of time (10 years). Probability of an event happening within the next 10 years was calculated as follows:

$$P_{X_i(t)} = 1 - S_{X_i(t)} = 1 - e^{-\left[H_{0(t)} \cdot e^{(\Sigma(\beta_i x_i) - \Sigma(\beta_i x_m))}\right]} = 1 - e^{-\left[-\ln(S_{0(t)}) \cdot e^{(\Sigma(\beta_i x_i) - \Sigma(\beta_i x_m))}\right]} = 1 - S_{0(t)}^{\,e^{(\Sigma[\beta_i x_i[-\Sigma[\beta_i x_m])}}$$

Where $e^{\Sigma(\beta i\, xi)}$ is the exponential of the sum of beta coefficients from the risk factors that are present in the person being evaluated, $\Sigma(\beta_i^{\wedge} x_m)$ is the exponential of the sum of beta coefficients from the risk factors that are present in the average population and $S_{0(t)}$ is the baseline probability of being event-free during a time (t).

Using Kaplan-Meier methods, 10-year survival probability of 88.14% was estimated for men and 91.15% for women.

Table 1 Supplementary Material

Distribution of Cardiovascular Risk Factors in the ERICE Study by Sex

		Men		Women		Total	
		N	%	n	%	n	%
		5413	45.9	6387	54.1		
Age	**<40**	963	17.8	972	15.2	1935	16.4
	40-49	1006	18.6	1233	19.3	2239	19
	50-59	825	15.2	937	14.7	1762	14.9
	60-69	1345	24.8	1520	23.8	2865	24.3
	70-79	965	17.8	1253	19.6	2218	18.8
	≥ 80	309	5.7	472	7.4	781	6.6
Systolic blood pressure	**< 140**	3258	60.2	3671	57.5	6929	58.7
	140-160	1469	27.1	1748	27.4	3217	27.3
	160-180	542	10	727	11.4	1269	10.8
	≥ 180	144	2.7	241	3.8	385	3.3
Cholesterol	**< 200**	2065	38.1	2290	35.9	4355	36.9
	200-249	2368	43.7	2764	43.3	5132	43.5
	250-299	837	15.5	1121	17.6	1958	16.6
	≥ 300	143	2.6	212	3.3	355	3
Diabetics		479	8.8	538	8.4	1017	8.6
Smoking		3328	61.9	964	15.2	4292	36.4

The value obtained is multiplied by 100 to estimate the percentage of risk that individuals with the characteristics described (age, systolic blood pressure, smoking, total cholesterol, diabetes) will develop a cardiovascular event within the next 10 years.

Table 2 Supplementary Material

Bivariate Model for a First Fatal or Nonfatal Cardiovascular Event

		Men				Women			
		Sig.	Exp(B)	95%CI		Sig.	Exp(B)	95%CI	
				Lower	Upper			Lower	Upper
Age		0.000	1.072	1.064	1.080	0.000	1.096	1.087	1.105
Smoking	**No**		1.000				1.000		
	Yes	0.052	1.205	0.998	1.453	0.000	0.440	0.344	0.562
Diabetes	**No**		1.000				1.000		
	Yes	0.000	1.949	1.532	2.480	0.000	2.472	1.945	3.141
Systolic blood pressure		0.000	1.024	1.020	1.028	0.000	1.023	1.019	1.027
Cholesterol		0.639	1.000	0.999	1.002	0.000	1.004	1.002	1.006
Body mass index		0.768	1.003	0.982	1.025	0.031	1.019	1.002	1.036
N					**5260**				**6187**