

Creating the cSCCscore Web Site

1. User Interface

1.1 Input data.

Please indicate the most appropriate response:

My gender is:

female ☐ male ☐

My current age is:

☐ years

My tendency to sunburn is:

Low ☐ Moderate ☐ High ☐

I have been diagnosed in the past with an actinic keratosis:

true ☐ false ☐

I have been diagnosed in the past with an invasive squamous cell skin cancer:

true ☐ false ☐

If false: I have been diagnosed in the past with a non-invasive (also called in-situ) squamous cell skin cancer:

true ☐ false ☐

I have been typed for the 16 genetic variants associated with increased risk of squamous cell skin cancer (*option to see a list of risk alleles for these sixteen variants*):

true ☐ false ☐

If true: The number of risk alleles that I carry is:

< 8 ☐ 8 or 9 ☐ 10 or more ☐

If false: Based on the squamous cell skin cancer histories of my parents, siblings and children, my genetic risk for this cancer is:

Low ☐ Moderate ☐ High ☐.

This input is transformed into the eight covariates shown in Table 1.

2. Using the input data to produce the output.

The output is the probability P of developing a squamous cell cancer in the next three years. P is given by

$$P = 1 - \left[1 + \frac{\phi}{\alpha_1} \exp \left(\alpha_0 + 3\alpha_1 + \sum_{j=1}^8 \beta_j z_j \right) \right]^{-\frac{1}{\phi}}. \quad (1)$$

Equation (1) involves eight covariates z_1, \dots, z_8 whose values are created using the patient's input, and 11 parameters, whose definitions & sex-specific values are given in Table 2.

2.1 Using the Input to create the covariates. Table 1 shows how to create the covariates from the input data.

Table 1.

Symbo l	Covariate
z_1	Age (yrs) ÷ 10
z_2^a	Moderate sun sensitivity
z_3^a	High sun sensitivity
z_4^a	Moderate genetic risk
z_5^a	High genetic risk
z_6^a	Hx of actinic keratosis
z_7	Hx of Noninvasive SCSC
z_8^a	Hx of Invasive SCSC

a) $z = 1$ if box is checked; $z = 0$ otherwise

b) SCSC = squamous cell skin cancer

2.2 Using the covariates to create the assigned probability P of developing a new cancer in the next three years.

Table 2. Sex-specific Parameter Values

Description	Symbol	Value	
		FEMALES	MALES
	Covariate Regression Coefficients		
Age/10	β_1	0.67	0.62
Mod Sun	β_2	0.08	0.09
High Sun	β_3	0.27	0.13
Mod Risk	β_4	0.16	0.30
High risk	β_5	0.54	0.66
AK hx	β_6	1.74	1.80
Noninvasive hx	β_7	0.98	1.02
Invasive hx	β_8	1.51	1.37
	Other Parameters		
intercept	α_0	-10.50	-9.89
Time trend	α_1	0.17	0.17
Variance	ϕ	3.42	2.60

2.2 Final Output to user:

Your probability of developing a new squamous cell skin cancer in the next three years is _____ % (INSERT 100xP).

