

Supplementary information

The survival function at time t of the Weibull regression models is $S(t) = \exp\{-\lambda \exp(X\beta) t^\rho\}$, where λ represents the Weibull scale parameter, ρ the Weibull shape parameter and β the regression coefficients for the vector of risk factors X . The statistical outputs of these Weibull equations are shown in Figure S1–Figure S5.

Figure S1: Statistical output of Weibull equation for CHD

```
. nl (chd_cif = 1- exp(-{lamb=0.0001}*sttime^{rho=1})) if sttime<7.85
(obs = 433)
```

Iteration 0: residual SS = 1.92e-07
 Iteration 1: residual SS = 1.82e-08
 Iteration 2: residual SS = 2.81e-09
 Iteration 3: residual SS = 2.79e-09
 Iteration 4: residual SS = 2.79e-09
 Iteration 5: residual SS = 2.79e-09

Source	SS	df	MS		
Model	5.929e-07	2	2.9645e-07	Number of obs =	433
Residual	2.789e-09	431	6.4720e-12	R-squared =	0.9953
Total	5.957e-07	433	1.3757e-09	Adj R-squared =	0.9953
				Root MSE =	2.54e-06
				Res. dev. =	-9928.813

chd_cif	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
/lamb	5.22e-06	9.31e-08	56.04	0.000	5.03e-06	5.40e-06
/rho	1.395373	.0103113	135.32	0.000	1.375106	1.41564

Figure S2: Statistical output of Weibull equation for stroke

```
. nl (stroke_cif = 1- exp(-{lamb=0.0001}*sttime^{rho=1})) if sttime<7.85
(obs = 433)
```

```
Iteration 0: residual SS = 4.48e-08
Iteration 1: residual SS = 5.73e-09
Iteration 2: residual SS = 4.97e-09
Iteration 3: residual SS = 4.97e-09
Iteration 4: residual SS = 4.97e-09
Iteration 5: residual SS = 4.97e-09
```

Source	SS	df	MS			
Model	9.878e-07	2	4.9390e-07	Number of obs =	433	
Residual	4.965e-09	431	1.1520e-11	R-squared =	0.9950	
Total	9.928e-07	433	2.2928e-09	Adj R-squared =	0.9950	
				Root MSE =	3.39e-06	
				Res. dev. =	-9679.137	

stroke_cif	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
/lamb	.00001	1.56e-07	64.24	0.000	9.70e-06	.0000103
/rho	1.158394	.0092365	125.41	0.000	1.140239	1.176548

Figure S3: Statistical output of Weibull equation for overt nephropathy

```
. nl (neph_cif = 1- exp(-{lamb=0.0001}*sttime^{rho=1})) if sttime < 7.85
(obs = 433)
```

```
Iteration 0: residual SS = 3.07e-07
Iteration 1: residual SS = 6.59e-08
Iteration 2: residual SS = 6.09e-08
Iteration 3: residual SS = 6.09e-08
Iteration 4: residual SS = 6.09e-08
Iteration 5: residual SS = 6.09e-08
```

Source	SS	df	MS			
Model	5.874e-06	2	2.9371e-06	Number of obs =	433	
Residual	6.086e-08	431	1.4121e-10	R-squared =	0.9897	
Total	5.935e-06	433	1.3707e-08	Adj R-squared =	0.9897	
				Root MSE =	.0000119	
				Res. dev. =	-8593.993	

neph_cif	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
/lamb	.0000231	5.29e-07	43.62	0.000	.0000221	.0000241
/rho	1.191976	.0135456	88.00	0.000	1.165353	1.2186

Figure S4: Statistical output of Weibull equation for non-CV mortality

```
. nl (mort_cif = 1- exp(-{lamb=0.0001}*sttime^{rho=1})) if sttime<8.5
(obs = 444)
```

Iteration 0: residual SS = 3.42e-06
Iteration 1: residual SS = 8.86e-07
Iteration 2: residual SS = 6.00e-08
Iteration 3: residual SS = 5.66e-08
Iteration 4: residual SS = 5.52e-08
Iteration 5: residual SS = 5.52e-08

Source	SS	df	MS			
Model	5.449e-06	2	2.7246e-06	Number of obs =	444	
Residual	5.522e-08	442	1.2493e-10	R-squared =	0.9900	
Total	5.504e-06	444	1.2397e-08	Adj R-squared =	0.9899	
				Root MSE =	.0000112	
				Res. dev. =	-8866.649	

mort_cif	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
/lamb	.00001	2.99e-07	33.54	0.000	9.45e-06	.0000106
/rho	1.605988	.0163584	98.18	0.000	1.573838	1.638138

Figure S5: Statistical output of Weibull equation for retinopathy

```
. nl (retino_cif = 1- exp(-{lamb=0.0001}*sttime^{rho=1})) if sttime<9.0
(obs = 445)
```

Iteration 0: residual SS = .0104453
Iteration 1: residual SS = .0011583
Iteration 2: residual SS = .0008264
Iteration 3: residual SS = .0001127
Iteration 4: residual SS = .0000908
Iteration 5: residual SS = .0000907
Iteration 6: residual SS = .0000907
Iteration 7: residual SS = .0000907
Iteration 8: residual SS = .0000907
Iteration 9: residual SS = .0000907

Source	SS	df	MS			
Model	.01346512	2	.00673256	Number of obs =	445	
Residual	.0000907	443	2.0474e-07	R-squared =	0.9933	
Total	.01355582	445	.000030463	Adj R-squared =	0.9933	
				Root MSE =	.0004525	
				Res. dev. =	-5592.821	

retino_cif	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
/lamb	.001882	.0000258	72.98	0.000	.0018313	.0019327
/rho	.8276945	.0082764	100.01	0.000	.8114286	.8439604

For extrapolation beyond the end of follow-up, the regression coefficients (

Table **S1**) are multiplied by patient baseline characteristics and summed to a total. As the model simulation progresses, the multipliers assigned to certain coefficients vary, either with time (e.g. increase in age, years since diagnosis) or by treatment (e.g. treatment effect on risk factors, natural progression of disease). The total of the coefficients is then multiplied by the Weibull hazard at time, t , to determine the probability of experiencing complications in each model year (cycle).

Table S1: Regression parameters

Parameter	CHD coefficient	Stroke coefficient	Non-CV mortality coefficient	Overt nephropathy coefficient	Retinopathy coefficient
Scale parameter (lambda)	0.0000052	0.00001	0.0000	0.00002	0.00188
Lambda standard error	$9.31e^{-8}$	$1.56e^{-7}$	$2.99e^{-7}$	$5.29e^{-7}$	0.0000258
Shape parameter (rho)	1.3954	1.1584	1.6060	1.19198	0.82769
Rho standard error	0.0103113	0.0092365	0.0163584	0.0135456	0.0082764
Sex (female=1, male=0) †	-0.862	-0.801	-0.616	0.000	0.000
Age in year/10 [†]	0.330	0.434	0.890	0.000	0.139
HbA _{1c} % [†]	0.200	0.200	0.000	0.239	0.282
Years after diagnosis [†]	0.000	0.000	0.000	0.000	0.049
BMI (<18.5 kg/m ² ; yes=1, no=0) †	0.000	0.000	1.089	0.000	-0.392
BMI (>=25 kg/m ² ; yes=1, no=0) †	0.000	0.000	0.171	0.000	0.202
SBP in mmHg/10 [†]	0.124	0.146	0.000	0.107	0.000
Non-HDL-c in mmol/L [†]	0.445	0.320	0.000	0.000	0.000
Log (ACR in mg/mmol) †	0.000	0.000	0.000	1.143	0.108
Smoker (no=0, current=1) †	0.585	0.000	0.725	0.805	0.000
Exercise (no=0, yes=1) †	0.000	-0.633	-0.590	0.000	0.000
Atrial fibrillation [†]	0.000	2.489	0.000	1.769	0.000

Abbreviations: ACR, albumin-to-creatinine ratio; BMI, body mass index; CHD, coronary heart disease; CV, cardiovascular disease; HbA_{1c}, glycated hemoglobin; JDCS, Japan Diabetes Complications Study; J-EDIT, Japanese Elderly Diabetes Intervention Trial; non-HDL-c, non-high density lipoprotein cholesterol; SBP, systolic blood pressure.

† The coefficients were obtained by fitting the corresponding models to the dataset from JDCS and J-EDIT.