Table 1. Characteristics of the 15 studies contributing to the complete CIRCORT dataset.

Study ID	Population	Country	No. of participants (days per participant)	Age in years (mean, range)	% Male	Mean time of awakening	Samples (n)	Assay	Sampling scheme	Reference
1	Children	USA	111 (1.9)	3.8 (3.2-4.5)	45%	07:36	804	DELFIA	AW30, 11, 16, BT	–
2	Children	USA	170 (1.9)	4.3 (0.5-7)	52%	07:57	1.222	DELFIA	AW, 10, 16, BT	–
3	School children	Netherlands	96 (1.9)	9.1 (8.9-11.4)	53%	07:01	830	IBL	AW, AW15, AW30, AW45, 12:00	–
4	Children. population sample	Netherlands	1.758 (1.0)	11.1 (10-12)	49%	07:00	5.119	IBL	AW, AW30, 20:00	TRAILS (Rosmalen et al., 2005)
5	School children	Netherlands	160 (1.8)	12 (12-12)	49%	07:27	1.022	DELFIA	AW, AW15, AW30, AW45, 12:00, 20:00	NTR (Bartels et al., 2003)
6	Adolescents	Netherlands	326 (2.9)	17.1 (16.1-18.3)	27%	06:49	5.256	IBL	AW, AW30, 9:30, 15:00, 19:00, 22:00	NTR (Kupper et al., 2005)
7	Adolescents	Netherlands	159 (1.8)	18.2 (17.7-19.0)	45%	07:45	1.383	IBL	AW, AW15, AW30, AW45, 12:00	–
8	Students	Switzerland	152 (3.9)	27.2 (22-48)	66%	07:01	2.666	DELFIA	AW, AW30, 17:00, 18:00, 18:30	–
9	Adults. industrial employees	Germany	731 (3.7)	41.7 (16-63)	90%	05:57	17.774	IBL	AW, AW30, 8:00, 11:00, 15:00, 20:00, S15, S45	–
10	Adults. birth cohort	UK	6.081 (1.0)	45.2 (44.3-47.6)	48%	07:21	11.857	IBL	AW45, 11:15	British Birth Cohort (Power et al., 2008)
11	Adults. industrial employees	Germany	539 (1.9)	45.4 (20-71)	88%	05:22	3.276	IBL	11:00, 13:00, 18:00, 22:00, S15 / AW, AW30, 8:00	–
12	Adults. nationwide	USA	1.138 (3.9)	57.6 (33-84)	45%	06:39	16.980	IBL	AW, AW30, 12:00, BT	MIDUS (Karlamangla et al., 2013)
13	Adults	Germany	1.128 (1.0)	60.1 (49-72)	48%	07:42	4.244	IBL	AW, AW30, 12:00, BT	KORA (Lederbogen et al., 2010)
14	Adults. civil servants	UK	4.148 (1.0)	61.1 (50.5-73.9)	73%	06:43	24.454	IBL	AW, AW30, 9:30, 15:00, 19:00, 22:45	Whitehall II (Badrick et al., 2007)
15	Retirees	Netherlands	2.001 (1.0)	75.0 (65.2-98.5)	43%	07:33	7.766	IBL	AW, AW30, 17:00, BT	Rotterdam Study (Hofman et al., 2007)
Total			18.698 (1.4)	48.3 (8.9-98.5)	61%	06:47	104.623			

Note. Abbreviations in the sampling scheme column: AW = awakening sample. AW15-AW45 = 15. 30 or 45 min after awakening. BT = bedtime. S15 = 15 after stressor onset. S45 = 45 minutes after stressor onset. BS = beginning of working shift. numbers indicate the intended sampling time.

Table 3. Percentiles of diurnal salivary cortisol concentrations at various hours after awakening at 7:00.

		1 hour			3.5 hours			6 hours			8.5 hours			11 hours			13.5 hours			16 hours		
Age	Sex	5th	50th	95th	5th	50th	95th	5th	50th	95th	5th	50th	95th	5th	50th	95th	5th	50th	95th	5th	50th	95th
< 5	F	1.3	4.7	16.7	0.7	2.6	9.1	0.4	1.5	5.4	0.3	1.0	3.5	0.2	0.7	2.4	0.1	0.5	1.9	0.1	0.4	1.6
< 5	M	1.4	4.8	17.2	0.7	2.6	9.4	0.4	1.6	5.5	0.3	1.0	3.6	0.2	0.7	2.5	0.2	0.5	1.9	0.1	0.5	1.6
5 – 10	F	1.3	4.7	16.8	0.7	2.6	9.1	0.4	1.5	5.4	0.3	1.0	3.5	0.2	0.7	2.4	0.1	0.5	1.9	0.1	0.4	1.6
5 – 10	M	1.1	3.9	14.0	0.6	2.1	7.6	0.4	1.3	4.5	0.2	0.8	2.9	0.2	0.6	2.0	0.1	0.4	1.6	0.1	0.4	1.3
11 – 20	F	2.0	7.2	25.8	1.1	3.9	14.0	0.7	2.3	8.3	0.4	1.5	5.3	0.3	1.1	3.8	0.2	0.8	2.9	0.2	0.7	2.4
11 – 20	M	1.8	6.4	22.8	1.0	3.5	12.4	0.6	2.1	7.3	0.4	1.3	4.7	0.3	0.9	3.3	0.2	0.7	2.6	0.2	0.6	2.1
21 – 30	F	2.1	7.5	26.7	1.1	4.1	14.5	0.7	2.4	8.6	0.4	1.6	5.5	0.3	1.1	3.9	0.2	0.8	3.0	0.2	0.7	2.5
21 – 30	M	2.0	7.1	25.3	1.1	3.9	13.7	0.6	2.3	8.1	0.4	1.5	5.2	0.3	1.0	3.7	0.2	0.8	2.8	0.2	0.7	2.4
31 – 40	F	1.8	6.5	23.3	1.0	3.6	12.6	0.6	2.1	7.5	0.4	1.4	4.8	0.3	1.0	3.4	0.2	0.7	2.6	0.2	0.6	2.2
31 – 40	M	1.8	6.6	23.3	1.0	3.6	12.7	0.6	2.1	7.5	0.4	1.4	4.8	0.3	1.0	3.4	0.2	0.7	2.6	0.2	0.6	2.2
41 – 50	F	1.8	6.3	22.5	1.0	3.4	12.3	0.6	2.0	7.3	0.4	1.3	4.7	0.3	0.9	3.3	0.2	0.7	2.5	0.2	0.6	2.1
41 – 50	M	1.8	6.3	22.6	1.0	3.4	12.3	0.6	2.0	7.3	0.4	1.3	4.7	0.3	0.9	3.3	0.2	0.7	2.5	0.2	0.6	2.1
51 – 60	F	1.8	6.4	22.7	1.0	3.5	12.3	0.6	2.0	7.3	0.4	1.3	4.7	0.3	0.9	3.3	0.2	0.7	2.5	0.2	0.6	2.1
51 – 60	M	2.0	7.1	25.3	1.1	3.9	13.7	0.6	2.3	8.1	0.4	1.5	5.2	0.3	1.0	3.7	0.2	0.8	2.8	0.2	0.7	2.4
61 – 70	F	1.9	6.8	24.2	1.0	3.7	13.1	0.6	2.2	7.8	0.4	1.4	5.0	0.3	1.0	3.5	0.2	0.8	2.7	0.2	0.6	2.3
61 – 70	M	2.1	7.3	26.0	1.1	4.0	14.1	0.7	2.3	8.4	0.4	1.5	5.4	0.3	1.1	3.8	0.2	0.8	2.9	0.2	0.7	2.4
71 – 80	F	2.0	7.2	25.7	1.1	3.9	13.9	0.7	2.3	8.3	0.4	1.5	5.3	0.3	1.1	3.7	0.2	0.8	2.9	0.2	0.7	2.4
71 – 80	M	2.2	7.9	28.2	1.2	4.3	15.3	0.7	2.5	9.1	0.5	1.6	5.9	0.3	1.2	4.1	0.2	0.9	3.2	0.2	0.7	2.6
> 80	F	2.2	7.9	28.1	1.2	4.3	15.2	0.7	2.5	9.0	0.5	1.6	5.8	0.3	1.1	4.1	0.2	0.9	3.1	0.2	0.7	2.6
> 80	M	2.5	8.8	31.2	1.3	4.8	16.9	0.8	2.8	10.0	0.5	1.8	6.5	0.4	1.3	4.5	0.3	1.0	3.5	0.2	0.8	2.9

Note. All concentrations are scaled in nmol/l (LC/MS-MS calibrated). Abbreviations in the sex column: F = female (grey shaded cells). M = male.

Table 2. Mixed effects growth curve models of diurnal salivary cortisol

Model	(1) Time + Awakening	(2) … + Age + Sex	(3) … + Season
No. of samples / studies	83.306 / 15	83.306 / 15	28.667 / 6
Predictors			
Intercept (β_0)	**2.091 (0.105)**	**2.099 (0.095)**	**2.140 (0.214)**
Time since awakening (β_1, per 6 hours)	**-1.647 (0.011)**	**-1.648 (0.011)**	**-1.440 (0.017)**
Time since awakening^2 (β_2)	**0.238 (0.004)**	**0.238 (0.004)**	**0.174 (0.006)**
Time of awakening (β_3, per hour after 7:00)	**-0.098 (0.003)**	**-0.099 (0.003)**	**-0.105 (0.006)**
Male sex (β_0)		**0.031 (0.009)**	**0.047 (0.017)**
Age > 5 years		-0.056 (0.039)	–
Age > 10 years		0.131 (0.073)	–
Age > 20 years		**0.080 (0.038)**	0.048 (0.044)
Age > 30 years		0.029 (0.023)	-0.012 (0.017)
Age > 40 years		0.015 (0.015)	-0.009 (0.010)
Age > 50 years		**0.022 (0.011)**	0.001 (0.007)
Age > 60 years		**0.021 (0.008)**	0.007 (0.007)
Age > 70 years		**0.025 (0.007)**	0.004 (0.007)
Age > 80 years		**0.029 (0.006)**	**0.014 (0.006)**
Season: Spring			Reference
Season: Summer			**-0.052 (0.023)**
Season: Autumn			**-0.111 (0.025)**
Season: Winter			-0.007 (0.025)
Variance components			
Days (ξ_d)	0.034	0.034	0.034
Participants (ξ_{0p} + ξ_{1p})	0.130 + 0.063	0.130 + 0.063	0.190 + 0.064
Studies (ξ_s)	0.163	0.130	0.248
Residuals (ε_{idps})	0.463	0.463	0.436

Note. As regressions were performed on log-scaled cortisol concentrations, all of the above listed predictors multiplicatively impact cortisol on its natural nmol/l scale. Bold font indicates fixed effects, that fall below a significance threshold of $\alpha = 0.05$. Values in parenthesis indicate standard errors.