Supplementary Tables

Table S2-7 are GAM estimates and statistical outputs. The model estimates and related standard errors (Std.Error) were shown for parametric terms. For non-parametric smooth terms, their estimated and reference degrees of freedom (i.e. edf, sumEDF, Ref.df) and their test statistics were shown.

Table S1. R^2 for correlations among global data.

	Self-harm	**GDP**	**PM2.5**	**Temp**	**GHG**
Self-harm	1.00	0.95	0.03	0.74	0.77
GDP	-	1.00	0.04	0.64	0.80
PM2.5	-	-	1.00	0.06	0.00
Temp	-	-	-	1.00	0.50
GHG	-	-	-	-	1.00

Self-harm: Self-harm age-standardized incidence rate for both sexes (new cases per 100000)
GDP: GDP per capita (current US$)
PM2.5: PM2.5 air pollution, mean annual exposure ($\mu g/m^3$)
Temp: Temperature change relative to baseline climatology (°C)
GHG: Total greenhouse gas (GHG) emissions per capita (Mt CO2eq)

Table S2. Relative fit of GAM analyzing the predictors for log10-transformed self-harm incidence rate globally (total greenhouse gas emission per capita). AIC = Akaike information criterion. sumEDF indicates the degrees of freedom of the models. Model 16 was selected as the best model because of the lowest AIC. (related to Figure 1g)

GAM	AIC	sumEDF	Formula
0	-14557.42	174.84	gam(log10-transformed self-harm incidence rate ~ 1 + s(Country, bs = "re"))
1	-15105.04	178.34	gam(log10-transformed self-harm incidence rate ~ s(Country, bs = "re") + s(GDP))
2	-14956.91	178.86	gam(log10-transformed self-harm incidence rate ~ s(Country, bs = "re") + s(Year))
3	-15231.06	186.49	gam(log10-transformed self-harm incidence rate ~ s(Year) + s(GDP) + s(Country, bs = "re"))
4	-15346.1	193.38	gam(log10-transformed self-harm incidence rate ~ te(Year, GDP) + s(Country, bs = "re"))
5	-14585.07	182.36	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Country, bs = "re"))
6	-14978.65	185.00	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(Country, bs = "re"))
7	-15177.24	187.94	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(GDP) + s(Country, bs = "re"))
8	-15242.28	191.88	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + s(Country, bs = "re"))
9	-15344.25	195.32	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + te(Year, GDP) + s(Country, bs = "re"))
10	-15386.89	199.00	gam(log10-transformed self-harm incidence rate ~ te(GHG.EMISSION, GDP) + s(Year) + s(Country, bs = "re"))
11	-15318.88	202.30	gam(log10-transformed self-harm incidence rate ~ te(GHG.EMISSION, Year) + s(GDP) + s(Country, bs = "re"))
12	-15653.43	252.42	gam(log10-transformed self-harm incidence rate ~ te(GHG.EMISSION, Year, GDP) + s(Country, bs = "re"))
13	-15065.14	192.29	gam(log10-transformed self-harm incidence rate ~ te(GHG.EMISSION, Year) + s(Country, bs = "re"))
14	-15321.84	194.97	gam(log10-transformed self-harm incidence rate ~ te(GHG.EMISSION, GDP) + s(Country, bs = "re"))
15	-15374.84	212.91	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + ti(GHG.EMISSION, Year, GDP) + s(Country, bs = "re"), data = complete
16	**-15708.42**	**233.82**	**gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + ti(GHG.EMISSION, Year, GDP) + ti(GHG.EMISSION, Year) + ti(GHG.EMISSION, GDP) + ti(GDP, Year) + s(Country, bs = "re"))**
17	-15515.49	215.45	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + ti(GHG.EMISSION, Year) + ti(GHG.EMISSION, GDP) + ti(GDP, Year) + s(Country, bs = "re"))

18	-15639.20	219.15	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + ti(GHG.EMISSION, Year, GDP) + ti(GHG.EMISSION, GDP) + ti(GDP, Year) + s(Country, bs = "re"))
19	-15646.26	217.28	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + ti(GHG.EMISSION, Year, GDP) + ti(GHG.EMISSION, Year) + ti(GDP, Year) + s(Country, bs = "re"))
20	-15634.85	221.01	gam(log10-transformed self-harm incidence rate ~ s(GHG.EMISSION) + s(Year) + s(GDP) + ti(GHG.EMISSION, Year, GDP) + ti(GHG.EMISSION, Year) + ti(GHG.EMISSION, GDP) + s(Country, bs = "re"))

Table S3. Estimated effects of total greenhouse gas (GHG) emission per capita, GDP per capita and year on log10-transformed self-harm incidence rate globally. (related to Figure 1g)

Parametric coefficients				
	Estimate	**Std.Error**	**t value**	**Pr(>|t|)**
(Intercept)	1.646419	0.002329	707.1	<2e-16
Approximate significance of smooth terms				
	edf	**Ref.df**	**F**	**P value**
s(GHG.EMISSION)	6.743	7.941	1.756	0.0988
s(Year)	4.866	5.956	16.199	<2e-16
s(GDP)	8.005	8.742	9.376	<2e-16
ti(GHG.EMISSION, Year, GDP)	17.527	19.358	11.234	<2e-16
ti(GHG.EMISSION, Year)	4.000	4.000	14.776	<2e-16
ti(GHG.EMISSION, GDP)	8.865	9.670	6.051	<2e-16
ti(Year, GDP)	8.817	10.280	7.600	<2e-16
s(Country)	174.006	175.000	1605.212	<2e-16
R-sq.(adj) = 0.992 Deviance explained = 99.2%				
GCV = 0.00080387 Scale est. = 0.00075251 n = 3660				

Table S4. Relative fit of GAM analyzing the predictors for log10-transformed self-harm incidence rate globally (temperature change relative to baseline climatology). AIC = Akaike information criterion. sumEDF indicates the degrees of freedom of the models. Model 16 was selected as the best model because of the lowest AIC. (related to Figure 1h)

GAM	AIC	sumEDF	Formula
0	-19582.21	195.77	gam(log10-transformed self-harm incidence rate ~ 1 + s(Country, bs = "re"))
1	-20294.13	204.61	gam(log10-transformed self-harm incidence rate ~ s(Country, bs = "re") + s(GDP))
2	-19935.22	201.68	gam(log10-transformed self-harm incidence rate ~ s(Country, bs = "re") + s(Year))
3	-20357.67	211.64	gam(log10-transformed self-harm incidence rate ~ s(Year) + s(GDP) + s(Country, bs = "re"))
4	-20518.72	218.18	gam(log10-transformed self-harm incidence rate ~ te(Year, GDP) + s(Country, bs = "re"))
5	-19703.61	201.53	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Country, bs = "re"))
6	-19978.92	207.08	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(Country, bs = "re"))
7	-20317.47	209.92	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(GDP) + s(Country, bs = "re"))
8	-20383.29	217.10	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + s(Country, bs = "re"))
9	-20532.60	223.60	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + te(Year, GDP) + s(Country, bs = "re"))
10	-20456.89	222.62	gam(log10-transformed self-harm incidence rate ~ te(TEMPCHANGE, GDP) + s(Year) + s(Country, bs = "re"))
11	-20395.63	222.50	gam(log10-transformed self-harm incidence rate ~ te(TEMPCHANGE, Year) + s(GDP) + s(Country, bs = "re"))
12	-20697.49	269.46	gam(log10-transformed self-harm incidence rate ~ te(TEMPCHANGE, Year, GDP) + s(Country, bs = "re"))
13	-20019.53	214.24	gam(log10-transformed self-harm incidence rate ~ te(TEMPCHANGE, Year) + s(Country, bs = "re"))
14	-20391.18	215.51	gam(log10-transformed self-harm incidence rate ~ te(TEMPCHANGE, GDP) + s(Country, bs = "re"))
15	-20646.97	237.61	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + ti(TEMPCHANGE, Year, GDP) + s(Country, bs = "re"), data = complete
16	**-20764.19**	**249.59**	**gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + ti(TEMPCHANGE, Year, GDP) + ti(TEMPCHANGE, Year) + ti(TEMPCHANGE, GDP) + ti(GDP, Year) + s(Country, bs = "re"))**
17	-20686.44	243.74	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + ti(TEMPCHANGE, Year) + ti(TEMPCHANGE, GDP) + ti(GDP, Year) + s(Country, bs = "re"))

18	-20763.32	248.13	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + ti(TEMPCHANGE, Year, GDP) + ti(TEMPCHANGE, GDP) + ti(GDP, Year) + s(Country, bs = "re"))
19	-20759.4	240.51	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + ti(TEMPCHANGE, Year, GDP) + ti(TEMPCHANGE, Year) + ti(GDP, Year) + s(Country, bs = "re"))
20	-20677.04	265.41	gam(log10-transformed self-harm incidence rate ~ s(TEMPCHANGE) + s(Year) + s(GDP) + ti(TEMPCHANGE, Year, GDP) + ti(TEMPCHANGE, Year) + ti(TEMPCHANGE, GDP) + s(Country, bs = "re"))

Table S5. Estimated effects of temperature change relative to baseline climatology, GDP per capita and year on log10-transformed self-harm incidence rate globally. (related to Figure 1h)

Parametric coefficients				
	Estimate	**Std.Error**	**t value**	**Pr(>|t|)**
(Intercept)	1.667	0.543	3.071	0.00214
Approximate significance of smooth terms				
	edf	**Ref.df**	**F**	**P value**
s(TEMPCHANGE)	1.635	2.092	2.880	0.0604
s(Year)	6.696	7.825	7.183	<2e-16
s(GDP)	8.768	8.978	20.117	<2e-16
ti(TEMPCHANGE, Year, GDP)	11.652	12.797	8.442	<2e-16
ti(TEMPCHANGE, Year)	2.207	3.033	1.422	0.2323
ti(TEMPCHANGE, GDP)	9.338	10.412	1.694	0.0786
ti(Year, GDP)	13.296	14.475	9.008	<2e-16
s(Country)	195.000	196.000	1269.356	<2e-16
R-sq.(adj) = 0.982 Deviance explained = 98.3%				
GCV = 0.0018607 Scale est. = 0.00017836 n = 6018				

Table S6. Relative fit of GAM analyzing the predictors for log10-transformed self-harm incidence rate globally (PM2.5 mean annual exposure). AIC = Akaike information criterion. sumEDF indicates the degrees of freedom of the models. Model 16 was selected as the best model because of the lowest AIC. (related to Figure 1i)

GAM	AIC	sumEDF	Formula
0	-20135.66	198.80	gam(log10-transformed self-harm incidence rate ~ 1 + s(Country, bs = "re"))
1	-20815.68	207.67	gam(log10-transformed self-harm incidence rate ~ s(Country, bs = "re") + s(GDP))
2	-20507.09	203.71	gam(log10-transformed self-harm incidence rate ~ s(Country, bs = "re") + s(Year))
3	-20864.59	213.17	gam(log10-transformed self-harm incidence rate ~ s(Year) + s(GDP) + s(Country, bs = "re"))
4	-21008.88	221.05	gam(log10-transformed self-harm incidence rate ~ te(Year, GDP) + s(Country, bs = "re"))
5	-20448.10	200.61	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Country, bs = "re"))
6	-20884.55	212.04	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(Country, bs = "re"))
7	-20983.55	212.23	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(GDP) + s(Country, bs = "re"))
8	-20985.65	216.42	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + s(Country, bs = "re"))
9	-21145.53	225.47	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + te(Year, GDP) + s(Country, bs = "re"))
10	-21312.38	227.40	gam(log10-transformed self-harm incidence rate ~ te(PM2.5, GDP) + s(Year) + s(Country, bs = "re"))
11	-21190.79	226.54	gam(log10-transformed self-harm incidence rate ~ te(PM2.5, Year) + s(GDP) + s(Country, bs = "re"))
12	-21783.36	299.76	gam(log10-transformed self-harm incidence rate ~ te(PM2.5, Year, GDP) + s(Country, bs = "re"))
13	-21087.55	218.81	gam(log10-transformed self-harm incidence rate ~ te(PM2.5, Year) + s(Country, bs = "re"))
14	-21258.99	221.72	gam(log10-transformed self-harm incidence rate ~ te(PM2.5, GDP) + s(Country, bs = "re"))
15	-21311.9	263.43	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + ti(PM2.5, Year, GDP) + s(Country, bs = "re"), data = complete
16	**-21841.08**	**305.11**	**gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + ti(PM2.5, Year, GDP) + ti(PM2.5, Year) + ti(PM2.5, GDP) + ti(GDP, Year) + s(Country, bs = "re"))**
17	-21724.29	256.44	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + ti(PM2.5, Year) + ti(PM2.5, GDP) + ti(GDP, Year) + s(Country, bs = "re"))

18	-21743.06	298.52	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + ti(PM2.5, Year, GDP) + ti(PM2.5, GDP) + ti(GDP, Year) + s(Country, bs = "re"))
19	-21515.79	276.52	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + ti(PM2.5, Year, GDP) + ti(PM2.5, Year) + ti(GDP, Year) + s(Country, bs = "re"))
20	-21767.8	295.5	gam(log10-transformed self-harm incidence rate ~ s(PM2.5) + s(Year) + s(GDP) + ti(PM2.5, Year, GDP) + ti(PM2.5, Year) + ti(PM2.5, GDP) + s(Country, bs = "re"))

Table S7. Estimated effects of PM2.5 mean annual exposure, GDP per capita and year on log10-transformed self-harm incidence rate globally. (related to Figure 1i)

Parametric coefficients				
	Estimate	**Std.Error**	**t value**	**Pr(>|t|)**
(Intercept)	1.6778	0.1836	9.137	<2e-16
Approximate significance of smooth terms				
	edf	**Ref.df**	**F**	**P value**
s(PM2.5)	7.750	8.622	7.204	<2e-16
s(Year)	5.554	6.801	6.654	<2e-16
s(GDP)	8.665	8.958	17.696	<2e-16
ti(PM2.5, Year, GDP)	49.798	53.180	3.582	<2e-16
ti(PM2.5, Year)	9.888	11.156	12.977	<2e-16
ti(PM2.5, GDP)	15.222	15.570	22.144	<2e-16
ti(Year, GDP)	9.234	10.772	8.207	<2e-16
s(Country)	197.997	199.000	1452.595	<2e-16
R-sq.(adj) = 0.985 Deviance explained = 98.6%				
GCV = 0.0015723 Scale est. = 0.0014928 n = 6034				