Supplementary File

Table S1. STROBE 2007 (v4) checklist of items to be included in reports of observational studies in epidemiology*

Checklist for cohort, case-control, and cross-sectional studies (combined)

Section/Topic	**Item #**	**Recommendation**	**Reported on page #**
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1, 2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4, 5
Objectives	3	State specific objectives, including any pre-specified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	6, 7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6, 7
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6, 7
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	6, 7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6, 7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6, 7

Bias	9	Describe any efforts to address potential sources of bias	7, 8
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6, 7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7, 8
		(*b*) Describe any methods used to examine subgroups and interactions	7, 8
		(*c*) Explain how missing data were addressed	7, 8
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	7, 8
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9, 10

		(*b*) Report category boundaries when continuous variables were categorized	9, 10
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9, 10
Discussion			
Key results	18	Summarise key results with reference to study objectives	11, 12, 13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13, 14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	14

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Table S2. Model fit assessment of a set of generalized additive model for location, scale and shape (GAMLSS) models where climatic variables including mean temperature (MeanTemp), rainfall (Rainfall) and relative humidity (RH) were modeled as smooth terms with different degrees of freedom (*df*). The criterion, Schwatz Bayesian Criterion (SBC), was used for model selection, where models with lower value of SBC are preferred. 0, 1, 2 and 3 were considered for the values of the parameter *df* in the GAMLSS models, respectively. Cubic spline (CS) function was used as the smooth function term.

Rank of model	Model formula	SBC
1	~ CS(MeanTemp, 1)	686.105
2	~ CS(MeanTemp, 2)	686.871
3	~ CS(MeanTemp, 3)	689.207
4	~ MeanTemp	690.681
5	~ CS(MeanTemp, 1) + CS(Rainfall, 1)	691.759
6	~ CS(MeanTemp, 2) + CS(Rainfall, 1)	691.811
7	~ CS(MeanTemp, 3) + CS(Rainfall, 1)	692.740
8	~ CS(MeanTemp, 1) + CS(Rainfall, 2)	693.124
9	~ CS(MeanTemp, 2) + CS(Rainfall, 2)	693.623
10	~ MeanTemp + Rainfall	694.608
11	~ MeanTemp + RH	694.628
12	~ CS(MeanTemp, 1) + CS(RH, 1)	694.790
13	~ CS(MeanTemp, 2) + CS(RH, 1)	695.267
14	~ CS(MeanTemp, 3) + CS(Rainfall, 2)	695.459
15	~ CS(MeanTemp, 3) + CS(RH, 1)	695.533
16	~ CS(MeanTemp, 1) + CS(Rainfall, 3)	696.474
17	~ CS(MeanTemp, 2) + CS(Rainfall, 3)	697.546
18	~ CS(MeanTemp, 2) + CS(RH, 1) + CS(Rainfall, 1)	699.055
19	~ CS(MeanTemp, 3) + CS(RH, 1) + CS(Rainfall, 1)	699.193
20	~ CS(MeanTemp, 1) + CS(RH, 2)	699.303
21	~ CS(MeanTemp, 3) + CS(Rainfall, 3)	699.363
22	~ CS(MeanTemp, 2) + CS(RH, 1) + CS(Rainfall, 2)	699.565
23	~ CS(MeanTemp, 1) + CS(RH, 1) + CS(Rainfall, 1)	699.655
24	~ MeanTemp + RH + Rainfall	699.672
25	~ CS(MeanTemp, 2) + CS(RH, 2)	699.851
26	~ CS(MeanTemp, 3) + CS(RH, 2)	700.121
27	~ CS(MeanTemp, 3) + CS(RH, 1) + CS(Rainfall, 2)	700.460
28	~ CS(MeanTemp, 1) + CS(RH, 1) + CS(Rainfall, 2)	700.535
29	~ CS(MeanTemp, 2) + CS(RH, 1) + CS(Rainfall, 3)	703.064
30	~ CS(MeanTemp, 2) + CS(RH, 2) + CS(Rainfall, 1)	703.307

31	~ CS(MeanTemp, 3) + CS(RH, 2) + CS(Rainfall, 1)	703.395
32	~ CS(MeanTemp, 1) + CS(RH, 1) + CS(Rainfall, 3)	703.790
33	~ CS(MeanTemp, 2) + CS(RH, 2) + CS(Rainfall, 2)	703.836
34	~ CS(MeanTemp, 1) + CS(RH, 3)	703.955
35	~ CS(MeanTemp, 1) + CS(RH, 2) + CS(Rainfall, 1)	704.037
36	~ CS(MeanTemp, 3) + CS(RH, 1) + CS(Rainfall, 3)	704.168
37	~ CS(MeanTemp, 2) + CS(RH, 3)	704.432
38	~ CS(MeanTemp, 3) + CS(RH, 2) + CS(Rainfall, 2)	704.519
39	~ CS(MeanTemp, 3) + CS(RH, 3)	704.845
40	~ CS(MeanTemp, 1) + CS(RH, 2) + CS(Rainfall, 2)	705.177
41	~ RH	707.331
42	~ CS(MeanTemp, 2) + CS(RH, 2) + CS(Rainfall, 3)	707.364
43	~ CS(Rainfall, 1)	707.472
44	~ CS(Rainfall, 2)	707.558
45	~ Rainfall	707.656
46	~ CS(MeanTemp, 3) + CS(RH, 3) + CS(Rainfall, 1)	707.991
47	~ CS(MeanTemp, 2) + CS(RH, 3) + CS(Rainfall, 1)	708.093
48	~ CS(MeanTemp, 3) + CS(RH, 2) + CS(Rainfall, 3)	708.267
49	~ CS(MeanTemp, 1) + CS(RH, 2) + CS(Rainfall, 3)	708.330
50	~ CS(MeanTemp, 2) + CS(RH, 3) + CS(Rainfall, 2)	708.505
51	~ CS(MeanTemp, 1) + CS(RH, 3) + CS(Rainfall, 1)	708.792
52	~ CS(MeanTemp, 3) + CS(RH, 3) + CS(Rainfall, 2)	709.107
53	~ CS(MeanTemp, 1) + CS(RH, 3) + CS(Rainfall, 2)	709.867
54	~ CS(Rainfall, 3)	710.239
55	~ CS(RH, 1)	711.324
56	~ CS(MeanTemp, 2) + CS(RH, 3) + CS(Rainfall, 3)	712.016
57	~ RH + Rainfall	712.666
58	~ CS(MeanTemp, 3) + CS(RH, 3) + CS(Rainfall, 3)	712.849
59	~ CS(MeanTemp, 1) + CS(RH, 3) + CS(Rainfall, 3)	713.085
60	~ CS(RH, 2)	715.945
61	~ CS(RH, 1) + CS(Rainfall, 1)	717.272
62	~ CS(RH, 1) + CS(Rainfall, 2)	717.727
63	~ CS(RH, 3)	720.343
64	~ CS(RH, 1) + CS(Rainfall, 3)	721.098
65	~ CS(RH, 2) + CS(Rainfall, 1)	721.843
66	~ CS(RH, 2) + CS(Rainfall, 2)	722.342
67	~ CS(RH, 3) + CS(Rainfall, 1)	725.910
68	~ CS(RH, 2) + CS(Rainfall, 3)	725.926
69	~ CS(RH, 3) + CS(Rainfall, 2)	726.601
70	~ CS(RH, 3) + CS(Rainfall, 3)	730.204

R codes. Code examples show how to employ the time-dependent wavelet analysis to assess the periodicity of the time series, and GAMLSS model to study the association between seasonal characteristics of dengue and climatic variables in this study.

```
###########    Part I: Code example for generating Figure 5 in this study    ###########
# Wavelet analysis
# Install R package
install.packages("dplR")
# Load the package
library(dplR)
# Read the dataset 'mydata.csv' into R
my.data <- read.csv("mydata .csv", head=TRUE)

my.morlet <- morlet(y1=x, x1=my.data $week, p2=7, dj=0.1, siglvl=0.95)
# y1 denotes the series to be transformed
# x1 is a vector of values giving the years for the plot
# p2 represents the number of power of two to be computed for the wavelet transform
# siglvl is the level for the significance test
my.morlet$period    # The period
my.morlet$coi    # The cone of influence
my.morlet$Signif    # The significant values
my.morlet$Power    # The squared power

# The wavelet.plot function creates a filled.contour plot of a continuous wavelet transform as output from the morlet function.
wavelet.plot(my.morlet, useRaster=T, add.spline=T, reverse.y=T, add.coi=T, add.sig=T)

###########    Part II: Code example for generating Figure 6 in this study    ###########
# Generalized additive model for location, scale and shape model (GAMLSS) analysis
# Install R package
```

```
install.packages("gamlss")

# Load the package

library(gamlss)

# Read the dataset ‘mydata.csv’ into R

my.data <- read.csv("mydata .csv", head=TRUE)

head(my.data)

# Establish a GAMLSS model using the gamlss.fit function

gamlss.fit <- gamlss(case_num ~ cs(avg_tem_mean, 3) + cs(avg_rh, 1) + cs(avg_rainfall, 2) ,
data= my.data, family=NBI, n.cyc=2000, trace=FALSE)

# The setting “family=NBI” denotes the negative binomial distribution used for the
corresponding link function for over-dispersed count data

gamlss.fit

# Calculate the Generalised Akaike information criterion for a fitted GAMLSS object

GAIC(gamlss.fit)

# Plot residual diagnostics for a fitted GAMLSS Object

plot(gamlss.fit$residuals)

# Plot regression terms for a specified parameter of a fitted GAMLSS object
term.plot(gamlss.fit, se=TRUE, partial=TRUE)
```