figure 5, there is about 150% deficit rainfall in 2012, which is obviously not correct. The dengue data given show 15,770 cases in 2012 (according to the NVBDCP data) against the actual NVBDCP data of 16,332 cases (as available in the NVBDCP website).

Based on a regression developed using just two years of real dengue data and provisional (wrong) data for the third year, the authors are reading too much into the patterns. They arbitrarily state that '....such an outbreak did not happen in 2011 and 2010, because the deficit in one of the determinant variables was counterbalanced by the surplus in the other determinant variable'. While it is an appreciable imagination by the authors with no supporting data, those factors are clearly not 'determinant factors' as the authors themselves accept on p. 175 'However, across the years, these (rainfall and power) did not correlate adequately. This signifies the role of other factors…'.

It is claimed that the study was designed to 'explore the relationships of rainfall and power supply with the dengue incidences to develop a model that can predict future possible seasonal dengue cases in Tamil Nadu and Puducherry…'. However the paper[1] does not provide any details of this 'prediction model' (regression equation) anywhere, although it discusses the accuracy and failure of this 'prediction model' without giving any clue about the regression used or its significance.

According to the figures 4 and 5 in the paper[1], only rainfall and not power is strongly correlated with dengue cases. But the authors have a different opinion and state 'overall rainfall and power supply showed significant positive correlation with the weekly IDSP reported dengue cases ($r = 0.967$, $P = 0.033$ for rainfall, and $r = 0.972$, $P = 0.028$ for power supply)'. Either these correlation coefficients or the figure can only be true; both cannot. The authors further contradict it stating '… power-cut alone was ruled out of any significant role'.

The paper[1] has committed basic flaws in interpreting the collected secondary data and the results. According to the authors, they have used the IDSP data on dengue cases as dependent variable for their regression modelling and they conclude that 'the present prediction model showed significant correlation with NVBDCP dengue cases, but not with IDSP dengue cases'. It is logically impossible and quite obviously the opposite is the fact as evident from the presented data and figures in the paper. How can one accept the authors' argument that the IDSP figures, i.e. 401, 422 and 4443 dengue cases respectively, in three consecutive years, are not correlated with the 'predicted' cases of dengue, i.e. 400, 421 and 4442 respectively, for the period? Interestingly, the entire discussion regarding the inadequacy of IDSP data is based on this wrong premise of this factual error and hence irrelevant and needs to be retracted.

1. Chandran, R. and Azeez, P. A., *Curr. Sci.*, 2015, **109**, 171–176.
2. Brunkard, J. M., Cifuentes, E. and Rothenberg, S. J., *Salud Pública Méx.*, 2008, **50**, 227–234.
3. Johansson, M. A., Dominici, F. and Glass, G. E., *PLoS Negl. Trop. Dis.*, 2009, **3**, e382.

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Response:

While commenting on our paper, Arun avers that incorrect and selective data have been used by us. At the outset, we wish to state that for the analysis we have used available appropriate and reliable data from authentic and responsible agencies. We did not attempt to use selected data with any bias. The agency from which we have sourced the data generally updates data of vector-borne disease incidences even after a year. Moreover, it clearly marks the numbers provided to indicate their provisional nature. It should be appreciated that the agency has the right to change the numbers at any point of time, as it gets further inputs from its sources. It may be noted that even as of 12 September 2015, dengue data (for 2014) are marked provisional (http://www.nvbdcp.gov.in/den-cd.html). It also may be noted that scientific analysis on secondary data, is always done on available data and the interpretation would be constrained by the data, which may be provisional or have limitations of data-collection protocols. As and when the data are improved, the results of the analysis could also change; the earlier conclusions would be strengthened, changed or at times refuted or dumped. We believe that this is the way science progresses.

Arun states that the paper does not cite the data source. While describing the methodology we have clearly mentioned the sources. It has been stated that our paper 'blatantly misquotes Brunkard *et al.*'. We disagree, since we have rightly quoted the study, which insightfully and commendably reports the small and significant role of climate factors, and does not specify their role in the spread of dengue. Further, it would be right to take note that relationships/associations among climate variables and other factors in dengue transmission, for that matter any such disease, are complex and dynamic. A climate variable may augment transmission potential of a disease through a specific (may be species-specific) variable, while simultaneously weakening its transmission potential through another highly dynamic situation. This intricacy should be kept in mind, especially while exploring/explaining statistical associations between vector-borne disease and climate, social or other variables. Statistical models, while to a great extent can account for the complex dynamics, at times pass over important factors of disease ecology, notably host/pathogen/vector species interactions, which may be apparently small but significant. There are several papers discussing such issues (e.g. Morin, C. W. *et al.*, *Environ. Health Perspect.*, 2013, **121**, 1264–1272). Further, in contrast to what Arun asserts, in our paper Johansson *et al.* (2009) was quoted in the introductory section to build our arguments with respect to role/relationship of the factors in dengue outbreak, and was not a misquote. We reiterate that the introduction section is a logical lead to further sections of the paper and need not necessarily conform to the results/conclusions of the same.

Regarding clarity on the dengue growth across the years under consideration, we admit that we regrettably missed the words 'an average of' before 175% in the 'Interestingly, every year, until 2011, there was 175% increase in dengue cases', as the value denotes an average of 3 years of (2008–09, 2009–10 and 2010–11) dengue growth (201%, 188% and 138%).

Table 1. Seasonal and IDSP cases

	Winter	Pre-monsoon	Monsoon	Post-monsoon
IDSP cases	210	1143	1633	2279
Rainfall	–41	–9	–3	16
Electricity	–12	–14	–11	–15

Table 2. Year-wise and NVBDCP cases

	2010	2011	2012
NVBDC cases	2,147	2,964	15,770
Rainfall	–11	41	–141
Electricity	–39.3	–38.9	–77

While stating 'Again on page 173, it is stated that "During the study period while the rainfall deficit increased, the number of reported cases of dengue decreased" ' once again Arun seems to be confused and has misunderstood figures 4 (seasonal and IDSP cases) and 5 (year-wise and NVBDCP cases). For easy understanding, we reproduce the respective data tables here – Table 1 represents figure 4, and Table 2 represents the figure 5 in our paper. We hope, after perusing the tables, the critic follows the interpretations given in p. 173.

Referring to p. 171 and figure 5, Arun doubts the veracity of the data used. He considers that the data we have used are not from authentic sources. While we have quoted information from newspapers in the introduction, we have used the data from India Meteorological Department for the analyses. Regarding rainfall ANOVA test results, Arun points out that there is contradiction between what is said on p. 173 and p. 175. Here we strongly disagree because both are different test results; on p. 173, we have dealt with seasonal rainfall for 5 years and its variations that are significant (winter, 56.1 mm; pre-monsoon, 353.8 mm; monsoon, 912.1 mm, and post-monsoon, 1511.8 mm), while on p. 175 we have provided year-wise actual rainfall and its variations that are insignificant (2010, 1122.1 mm; 2011, 1004.2 mm and 2012, 707.5 mm).

Referring to p. 175, he again talks about contradictions in the paper and argues about the prediction model accuracy (28.1%) and failure of the surveillance system in 2012, with which we again disagree totally, because the paper does not explain the failure of the surveillance system in 2012 based entirely on the prediction model accuracy. Instead, it explains the failure based on the magnitude of dengue incidences (spurt) in that particular year. Citing p. 174, the critic questions the goodness-of-fit of the prediction model. For a poorly-fitting (and low predictability) model, test of goodness-of-fit fails to prove any point. We have also amply acknowledged the failure of the prediction model on dengue, because dengue spurt is not determined by just one or two factors. A model with acceptable predictability possibly would require more factors to be taken into account. A model could also suffer from the inaccurate or frail datasets based on which it is developed. Arun could not rightly comprehend the arguments put forth in the paper that highlights the low predictability of the proposed model and the probable causative factors for the low predictability.

With respect to Arun's allegation of 'blatant and false information' regarding '150% deficit rain in 2012', we wish to state that the value is the cumulative percentage of deficit for all four seasons (winter, 70% + pre-monsoon, 32% + monsoon, 23% + post-monsoon, 16%). The cumulative percentage is 141% and not 150% as stated by Arun. Here, we regret that the word 'cumulative' was missed out while describing the seasonal rainfall deficit. Further, it may be noted that even if one calculates and plots a graph for yearly rainfall deficit in millimetre scale, instead of % scale (seasonal cumulative rainfall deficit), the graph and the pattern would look the same. It may be noted that seasonal deficit, more important for all seasonal ecological issues rather than annual deficit, the cumulative deficit could be more than what Arun assumes to be the maximum limit (it seems he wrongly assumes that the total is 100%).

The critic asserts that the number of dengue cases in 2012 used in our paper is false, without realizing that the NVBDCP data (Tamil Nadu, 12264 + Puducherry, 3506) are provisional (clearly indicated so in our paper), and the numbers are revised as and when updates from their sources are available. As explained earlier, the 2012 data are not wrong and we have drawn them from the authentic source. Regarding counterbalance of factors (which he almost brushes aside), we hope that Arun would be aware that surplus and deficit could counterbalance each other in their effects at times and when one takes a sufficiently long period (for example, in a yearly perspective, or a longer period with respect to the issue under consideration), especially if a conducive environment follows a non-conducive one. As clearly mentioned by us, 'other factors' remain external to the scope of the paper as of now. Regarding the formula of the prediction model, it is not always essential to provide the same. One can see several papers that have not provided detailed regression equations (e.g. Karim *et al.*, *Indian J. Med. Res.*, 2012, **136**(1), 32–39). However, we take note that it would have been better if we had included the same in the paper. We had constructed a linear equation model relating the independent variables (rainfall and power supply) and dengue incidences (as dependent variable), according to the general formula $Y = b_0 + b_1X_1 + b_2X_2 + ... + b_kX_k$, in which the coefficients (b_0, b_1, $b_2...b_k$) represent the contributions of each independent variable on the dependent variable. Accordingly, we estimated the equation $Y = -192.702 - 62.572*R + 0.793*P$ (where R is the rainfall and P the power) against seasonal dengue incidences.

We thank Arun for bringing out one mistake in the paper on p. 175. The sentence should read as 'the present prediction model showed significant correlation with NVBDCP dengue cases and with IDSP dengue cases'.

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