**Questions answered:**

What question/s is the paper trying to answer? What goal do they want to achieve? Did they answer/achieve it?

* The effect of climate variables on mosquito density and dengue risk across different cities in China.
* By mapping local trends and finer scale factors of the outbreaks, they hope to forecast future outbreaks and inform local mitigation measures.
* Did they achieve it?
  + At the end of the introduction, the authors hint that their model is working

*“Our findings demonstrate that the long-term city-level mosquito surveillance data are reliable for inferring dengue cases and have potential for projecting future risk in the face of a changing environment.”*

Is the paper biologically relevant? Is it novel?

* Not really novel – because many other papers have previously explored the relationship between climate and dengue outbreak.
  + However, they did include *mechanistic aspects of transmission added into the analyses, which take into account key epidemiological parameters (e.g. spatiotemporal variation in reproductive ratio, as well as forecasting future outbreak with a changing environment)*.
* Small scale, specific study – China – so it is biologically relevant.

Have they made any unfounded statements (Inferred more from the results than they should)?

* While it could be viewed as a downside to only include local cases from one region (China), the authors explicitly say that they are not trying to use global data in their analyses.
* However, they did say that their approach could be applied to studying other vector-borne diseases, without stating how.

Introduction:

* Introduces the topic, provides relevant background information but doing so concisely and effectively.
* Discusses the severity of the disease and illustrates the significance of the study.
* Indicates the relevance of the study to the region – saying that there are **recent** reported cases of the disease, therefore it is a *public health concern* and *economic burden*.
* Good justification of methods that will be used to determine the link between climate and dengue transmission.

Methodology:

* Explained SIR (define) model:
  + Models any disease
  + What’s the likelihood that each variable (person) will be infected: susceptible–infected–recovered
  + What is the likelihood that a susceptible person will become infected, what’s the likelihood of an infected person recovering.
  + Changing the parameters in between SIR to predict how the disease will change in the future

Results:

* Graphs were generally good and illustrative.
  + Unclear y-axis on fig 2 – possibly the density of mosquitos.
  + Units of y-axis are unclear
* Description of results was succinct.

Criticisms:

* Under-reporting cases? Since the symptoms are similar to the flu, some infected individuals might have the disease, but have not reported it or sought out treatment for it.
* Biweekly = that is how data was delivered to them by Chinese government
  + In equation 1 of the SIR: how did they get biweekly data if the mosquito abundance is monthly in the model – none of the parameters in the equation are biweekly.
    - “*M* is the biweekly mosquito density…”
    - Maybe the authors did manipulate the data to be monthly, but haven’t explicitly mentioned that they have done it. Always make sure you explicitly describe your methodology and analyses!

Comments:

* The format of the introduction includes a summary of all the other sections of the report (methods, results, discussion). While this might be odd, we must take into account different journal styles when considering the layout of an article.
* Dengue can only transfer with mosquito – not between people.

Questions asked:

1. What does they mean by this?

*“Although the climate–epidemic association and outbreak risks have been assessed using both statistical and mathematical models, local mosquito population dynamics have not been incorporated in a unified predictive framework.*

* 1. This means that they’ve taken predictors on a climate level (mean temperature and number of precipitating days) and they’ve linked that to the number of incidences. This is done to improve precision, predictions, as well as local control strategies.
  2. Excerpts from the article to explain this:

*“Global vector distribution and risk prediction cannot be* ***downscaled*** *spatially and temporally without the incorporation of* ***local vector dynamics and their link to environmental conditions.”***

*“Monitoring of* ***local mosquito abundance*** *on* ***finer spatiotemporal scales*** *is of great importance to understand the climate-epidemic interactions and the associated heterogeneities in transmission potential and outbreak risk, which could be used to inform* ***local control strategies and predict future threats”***