My Internet Search Path (so far):

Google: “southeast regional mosquito control workshop” →

<http://www.pherec.org> →

<http://www.pherec.org/wp-content/uploads/2014/06/Smith-John-CV-June-3-2014.pdf> →

Google “American Mosquito Control Association” →

<http://www.mosquito.org/> →

[NEW!! Click here to view AMCA's Best Practices for Integrated Mosquito Management Manual, 2017.](https://amca.memberclicks.net/assets/HomePage/amca%20guidelines%20final_pdf.pdf) [excerpts below]→

Ref #48 from AMCA’s BMP:

[Smith DL, Perkins TA, Reiner RC, Jr., et al. Recasting the theory of mosquito-borne pathogen transmission dynamics and control. Trans R Soc Trop Med Hyg. 2014;108(4):185-197](https://academic.oup.com/trstmh/article/108/4/185/1924536/Recasting-the-theory-of-mosquito-borne-pathogen) →

Google Scholar search on Smith et. al. (2014) above link from title. [excerpts below]→

Google Scholar citation list for Smith et. al. (2014):

<https://scholar.google.com/scholar?cites=7021969550325174614&as_sdt=40005&sciodt=0,10&hl=en>

[LaDeau, Shannon L., et al. "The ecological foundations of transmission potential and vector‐borne disease in urban landscapes." Functional ecology 29.7 (2015): 889-901.](http://onlinelibrary.wiley.com/doi/10.1111/1365-2435.12487/full)

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A new world malaria map: Plasmodium falciparum endemicity in 2010

<https://malariajournal.biomedcentral.com/articles/10.1186/1475-2875-10-378>

AMCA BMP → ref 41

California Department of Public Health MaVCAoC, University of California. California Mosquito-Borne Virus Surveillance and Response Plan.; 2017; 62 pp

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Notes on “amca guidelines final\_pdf.pdf”

BEST PRACTICES FOR INTEGRATED MOSQUITO MANAGEMENT: A FOCUSED UPDATE  
American Mosquito Control Association January 2017

URL:

<https://amca.memberclicks.net/assets/HomePage/amca%20guidelines%20final_pdf.pdf>

Page numbers refer to pdf count, not document page numbers.

Excerpts:

Page 25:

In addition to mapping raw data, it is often necessary to perform data analyses that integrate the information from one or more elements of mosquito surveillance and control programs. Spatial tools can provide useful indications to help prioritize public mosquito control measures in areas where nuisance, human-mosquito contact and risk of local arbovirus transmission are likely to be highest. This may include using simple risk models to integrate several surveillance data sets (41) or spatial analyses that help to clarify the relationship between multiple layers of spatial data. For example, GIS has been employed in many areas to understand local factors associated with Aedes distribution and abundance. (5,7,8,42-46) **More formal data analysis can also be done by modeling, integrating GIS data with standard statistical or mathematical models that capture the dynamics of mosquito populations or pathogen transmission. (47,48)** Detailed description of methods for spatial data analysis is beyond the scope of these recommendations.

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**Abstract (for #48)**  
Mosquito-borne diseases pose some of the greatest challenges in public health, especially in tropical and sub-tropical regions of the world. Efforts to control these diseases have been underpinned by a theoretical framework developed for malaria by Ross and Macdonald, including models, metrics for measuring transmission, and theory of control that identifies key vulnerabilities in the transmission cycle. That framework, especially Macdonald's formula for R0 and its entomological derivative, vectorial capacity, are now used to study dynamics and design interventions for many mosquito-borne diseases. A systematic review of 388 models published between 1970 and 2010 found that the vast majority adopted the Ross–Macdonald assumption of homogeneous transmission in a well-mixed population. Studies comparing models and data question these assumptions and point to the capacity to model heterogeneous, focal transmission as the most important but relatively unexplored component in current theory. **Fine-scale heterogeneity causes transmission dynamics to be nonlinear, and poses problems for modeling, epidemiology and measurement. Novel mathematical approaches show how heterogeneity arises from the biology and the landscape on which the processes of mosquito biting and pathogen transmission unfold.** Emerging theory focuses attention on the ecological and social context for mosquito blood feeding, the movement of both hosts and mosquitoes, and the relevant spatial scales for measuring transmission and for modeling dynamics and control.

…

**Modern theory**

**...**

A more recent trend that complements modeling studies is the creation, curation, and analysis of **databases describing MBPT, including mosquito bionomics, transmission metrics, and other important variables accumulated over more than a century of investigations.70–73** Mosquito ecology and MBPT are highly heterogeneous over space and time.74–77 At a large scale, it is important to know where transmission is occurring, so maps have played an important historical role in control. The role of maps and the supporting technologies have expanded substantially in recent years with the publication of global maps describing the distribution of malaria71,78 and of dengue.6 **Also of great interest are databases that have aggregated metrics of transmission, especially those studies that have measured two or more metrics at the same time and place, and that investigated the properties of various metrics across space and time or across transmission intensities.72,73,79 The marriage of models and large aggregated databases has made it possible to test and apply the models to an extent that has not been possible before.**

…

**Recasting theory**

**...**

If dispersion and the number of hosts in the neighborhood limits transmission, rather than VC, then thresholds on the coverage of vaccines, drugs, and other host-based interventions may not scale linearly with VC. What remains unknown, and is highly relevant for understanding transmission dynamics, is what happens to transmission as locally available hosts become saturated. It may be that, despite the nonlinearities in transmission caused by heterogeneous biting and local transmission, VC-based estimates of R0 are still relevant in an analysis of vector-based coverage levels and thresholds to eliminate a pathogen from an area. What may also be true is that the thresholds may scale differently for different modes of control depending on the context. **What is needed now is a new approach to measuring and modeling these aspects of transmission that can lay the foundations for an improved understanding of MBPT dynamics and control.**

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Gething PW, Patil AP, Smith DL, et al. . A new world malaria map: Plasmodium falciparum endemicity in 2010, Malar J , 2011, vol. 10 pg. 378** [**https://doi.org/10.1186/1475-2875-10-378**](https://doi.org/10.1186/1475-2875-10-378)

**Abstract  
  
Background**Transmission intensity affects almost all aspects of malaria epidemiology and the impact of malaria on human populations. Maps of transmission intensity are necessary to identify populations at different levels of risk and to evaluate objectively options for disease control. To remain relevant operationally, such maps must be updated frequently. Following the first global effort to map Plasmodium falciparum malaria endemicity in 2007, this paper describes the generation of a new world map for the year 2010. This analysis is extended to provide the first global estimates of two other metrics of transmission intensity for P. falciparum that underpin contemporary questions in malaria control: the entomological inoculation rate (Pf EIR) and the basic reproductive number (PfR).

**Hitting Hotspots: Spatial Targeting of Malaria for Control and Elimination**

http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001165

(2014 version of following ref#41 in AMCA BMP)

California Department of Public Health MaVCAoC, University of California. California Mosquito-Borne Virus Surveillance and Response Plan.; 2017; 62 pp

<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/2017CAMBVirusSurveillanceResponsePlan.pdf>

2017CAMBVirusSurveillanceResponsePlan 62 pp.pdf (somehow ended up w/2 versions, other 56 pp)

Page 10,

**Response Levels**

The California Mosquito-borne Virus Surveillance and Response Plan was developed to provide a semi-quantitative measure of virus transmission risk to humans that could be used by local mosquito control agencies to plan and modulate control activities. Independent models are presented for WEEV, SLEV, and WNV to accommodate the different ecological dynamics of these viruses (Barker et al. 2003). SLEV and WNV are closely related, require similar environmental conditions, and are transmitted by the same Culex vectors. Seven surveillance factors are measured and analyzed to determine the level of risk for human involvement and thereby gauge the appropriate response level:

1. Environmental or climatic conditions (e.g., snowpack, rainfall, and temperature)

2. Adult Culex vector abundance

3. Virus infection rate in Culex mosquito vectors

4. Sentinel chicken seroconversions

5. Fatal infections in birds (WNV only)

6. Infections in humans

7. Proximity of detected virus activity to urban or suburban regions (WEEV only)