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Is malaria vector control still useful despite insecticide resistance?

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Poster SHORT 02

Is vector control still useful despite insecticide resistance?

Haoues ALOUT



Combating resistance: microbes and vectors

2018 INTERNATIONAL PASTEUR INTERNATIONAL NETWORK SYMPOSIUM

Institut Pasteur, Paris – November 15-16, 2018

Is vector control still useful despite insecticide resistance?

Malaria prevalence: 50% reduction in 15 years

Contribution of control methods



Control of disease



21%



Control of transmission



79%

Bhatt *et al.* 2015



Insecticide resistance in malaria vectors



Is vector control still useful despite insecticide resistance?

Table 1. Protective Efficacy of the Vector Control Tool against the Malaria Burden

Year	Country	Vector control tool	Protective efficacy ^a		Type of control	Insecticide resistance	Mean efficacy (s.e.m) ^b	Refs
			Prevalence of parasitemia	Child morbidity				
1992	Gambia	ITN (permethrin)	7%	45%	Untreated	Susceptible	35% (21%)	[90–92]
1992	Cameroon	ITN (deltamethrin)	40%	NA ^c	No nets	Susceptible		[93,94]
1993–1995	Kenya	ITN (permethrin)	51%	NA	No nets	Susceptible		[95,96]
1996	Burkina Faso	ITC (permethrin)	57%	NA	No nets	Susceptible		[97,98]
1997–1999	Kenya	ITN (permethrin)	19%	55%	No nets	Low		[99,100]
2000	Ivory Coast	ITN (lambda-cyhalothrin)	17%	56%	No nets	High	33% (18%)	[24,101]
2004	Equatorial Guinea	IRS (deltamethrin)	47%	38%	Untreated	Moderate-high		[20,21]
2005	Burundi	ITN (deltamethrin), IRS (deltamethrin + alphacypermethrin)	55%	43%	Untreated	Moderate		[22,23]
2012	Malawi	ITN (deltamethrin)	30%	NA	No nets	Moderate		[25]
2014	Kenya	ITN	14%	NA	No nets	High		[26,27]

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Alout *et al.* 2017

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Cost of resistance



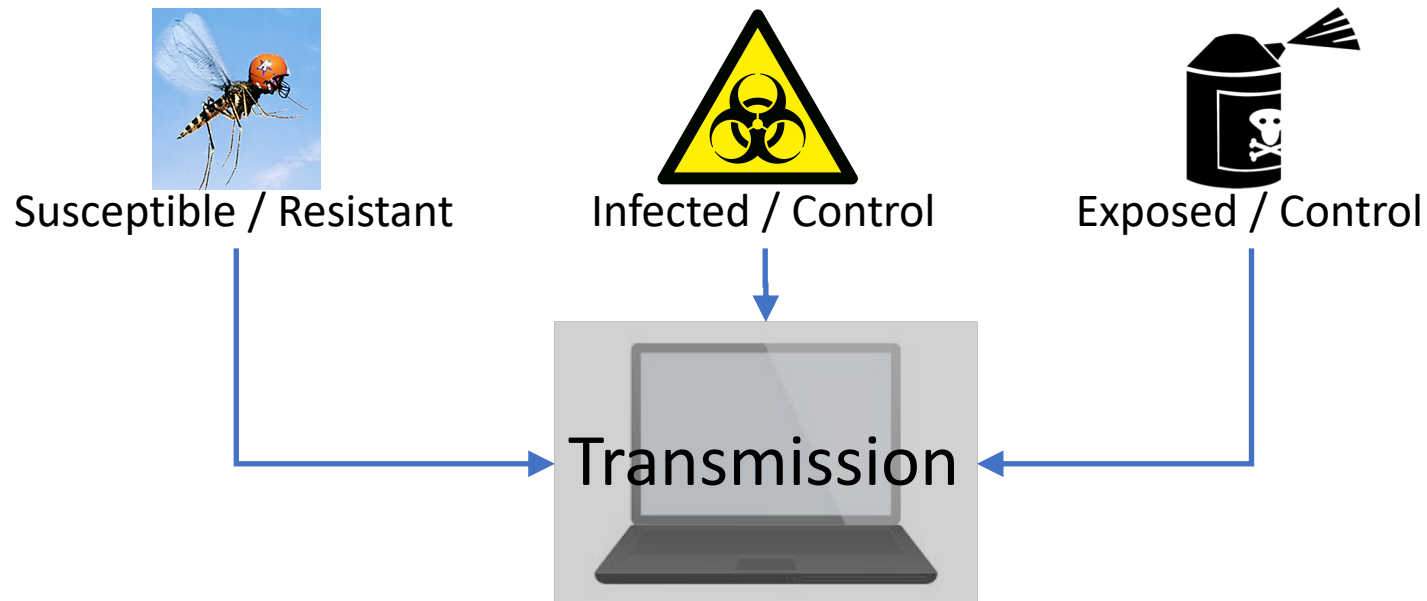
Modifications of several physiological and metabolic processes



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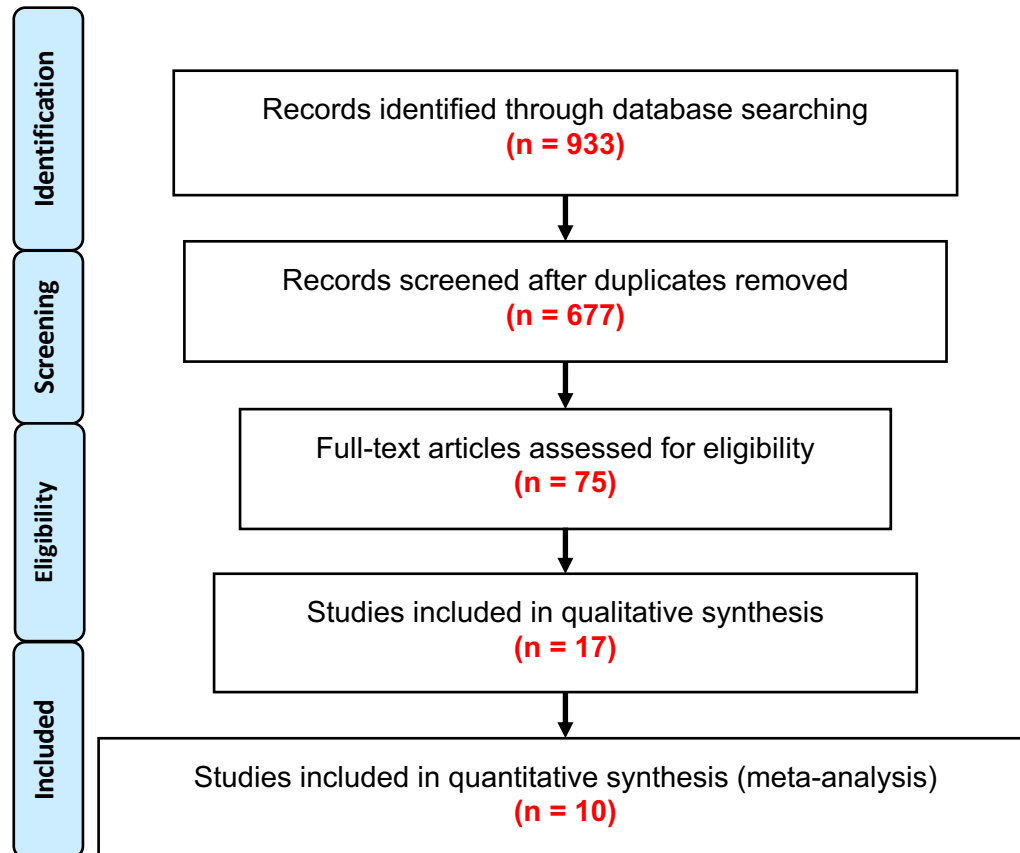
Interactions between:

Resistance genes – Infection – Insecticides



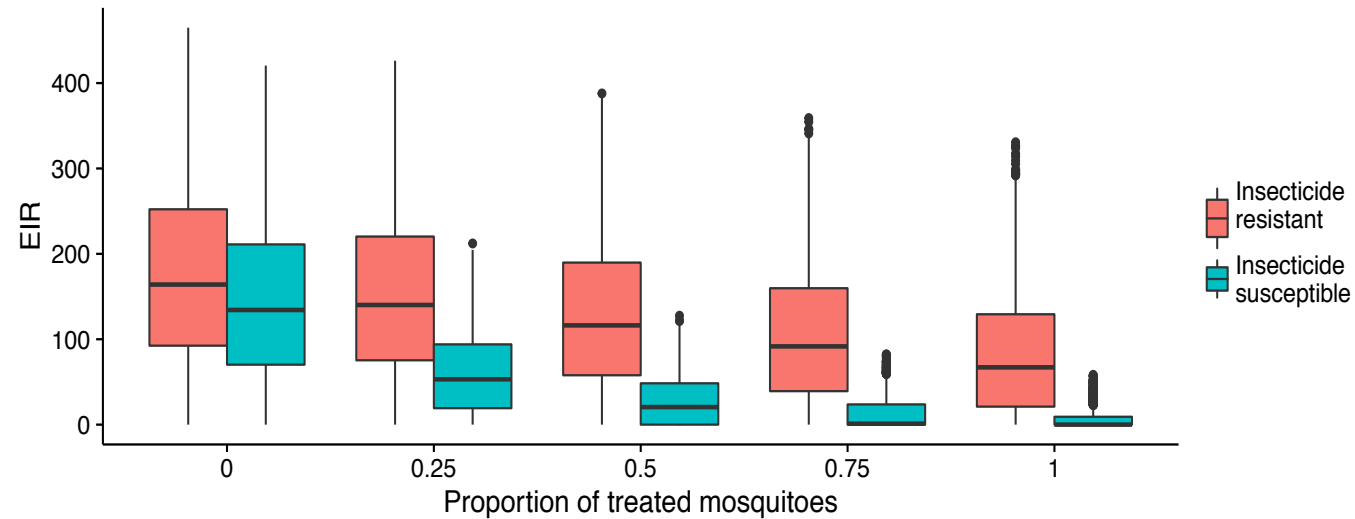
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Systematic review:



- Criteria :
- Experimental studies only
 - At least 1 resistant strain/pop
 - Known mechanism of resistance
 - Appropriate control

Is vector control still useful despite insecticide resistance?



In resistant populations, insecticides remain partially efficient to reduce malaria transmission

Is vector control still useful despite insecticide resistance?

Poster SHORT 02

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And thank you