

Risk of emergence of arboviral diseases in New- Caledonia

Version 1.0

Context

- ✿ Caledonian Society of Public Health
- ✿ Objectives of this study
- ✿ Multidisciplinary team
 - ✿ Doctors
 - ✿ Vets
 - ✿ Wildlife biologist
 - ✿ Entomologist

Methodology

✿ List of the countries studied

⇒ Direct communications with NC or existence of important communities in NC

- ✓ France
- ✓ Australia, Fiji, French Polynesia, New Zealand, Papua-New Guinea, Vanuatu, Wallis et Futuna
- ✓ China, South Korea, Indonesia, Japan, Philippines, Thailand, Vietnam
- ✓ Réunion Island
- ✓ Saudi Arabia (pilgrimage)

Methodology

✿ List of the pathogens studied

⇒ List of pathogens present in these countries

Mode de transmission		Agents infectieux identifiés
Maladies à transmission vectorielle	Avec transmission inter-humaine possible	<ul style="list-style-type: none">- Virus de la Dengue- Virus du Chikungunya- Plasmodium (Paludisme)
	Sans transmission inter-humaine possible	<ul style="list-style-type: none">- Ross river virus- Barmah Forest virus- Virus de l'Encéphalite Japonaise- Virus Kunjin- Murray Valley virus- West Nile virus
Maladies à transmission non vectorielle	Avec transmission inter-humaine possible	<ul style="list-style-type: none">- Virus grippal A(H1N1)- Enterovirus EV71- Virus de la rougeole- Bacille de Koch multi-résistant- Virus Nipah- Vibrio cholerae- Coronavirus
	Transmission inter-humaine pas possible ou peu fréquente	<ul style="list-style-type: none">- Virus grippal A(H5N1)- Virus Hendra- Australian Bat Lyssavirus- Virus de la rage canine (Lyssavirus)- Virus de l'Hépatite E

Methodology

✿ Evaluation of emergence risk



Risk of introduction

+

Risk of diffusion

=

Risk of emergence

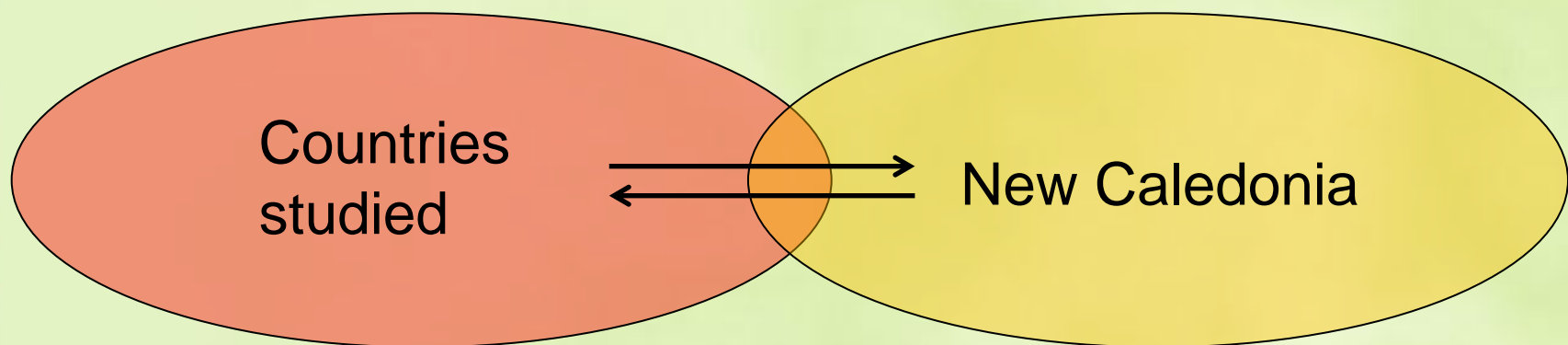
+ Sanitary and Social Impact

Risk of introduction

Geographic distribution

Incidence

Risk of contact traveller/vector



Number of passengers

Risk of introduction

through infected animals

Risk of diffusion

✿ Most important parameter

- ✿ Diffusion of the virus from a person ?

✿ Other parameters

- ✿ Presence of animal reservoir in NC
- ✿ Abundance and survey of vector
- ✿ Risk of contact Human / Vector
- ✿ Local system of detection (Human – Animal)
- ✿ Existence of control means (AVC, treatment...)

Sanitary and Social Impacts

- ✿ Disorganization of Caledonian society
 - ✿ Overwhelming of the health system
 - ✿ Clinical importance
 - ✿ Sequelae
 - ✿ Potential lethality in NC

- ✿ Do not impact the risk of emergence but represent a parameter to consider for policy makers

Results

Arthropod-borne viruses with **high** risk of emergence

Pathogen	Risk of introduction	Risk of diffusion	<i>Risk of emergence</i>	Possible sanitary and social impact
Dengue Virus	High	High	<i>High</i>	High
Chikungunya Virus	Low	High		High

= Contamination of mosquito from Human

Results

Arthropod-borne viruses with a risk of emergence :

Pathogen	Risk of emergence	Possible sanitary and social impact
Ross River Virus	<i>Low</i>	Low
Japanese Encephalitis Virus		Low
West Nile Virus		Low

Pathogen	Risk of emergence	Possible sanitary and social impact
Kunjin Virus	<i>Negligible</i>	Negligible
Murray Valley Virus		Negligible

= Contamination of mosquito from animal reservoir

Results

Arthropod-borne viruses with a special status

Pathogen	Risk of introduction	Risk of diffusion	<i>Risk of emergence</i>
Barmah Forest Virus	Unknown	Unknown	Unknown
Yellow Fever Virus	Low ?	High?	???

A risk evolving constantly

- ✿ Since the end of this study :
 - ✿ Outbreak of Chikungunya Virus in Yap
 - ✿ Outbreak of Zika Virus in F. Polynesia...
- ✿ Necessity to be ready !
- ✿ Study to be continually updated...

Recommendations

✿ General

- ✿ Interest of a multidisciplinary team
- ✿ Need of strategic adaptable plan (Cf DASSNC)
- ✿ Need an emergency Fund

✿ Specific (due to our study)

- ✿ To circumscribe the risk of introduction
- ✿ To circumscribe the risk of diffusion
- ✿ To circumscribe sanitary and social impact



Photo : Fabrice Brescia (IAC)