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AUTOCHTHONOUS CASES OF DENGUE IN MAINLAND FRANCE IN 2022

RISK MITIGATION IN FRANCE AND BEYOND

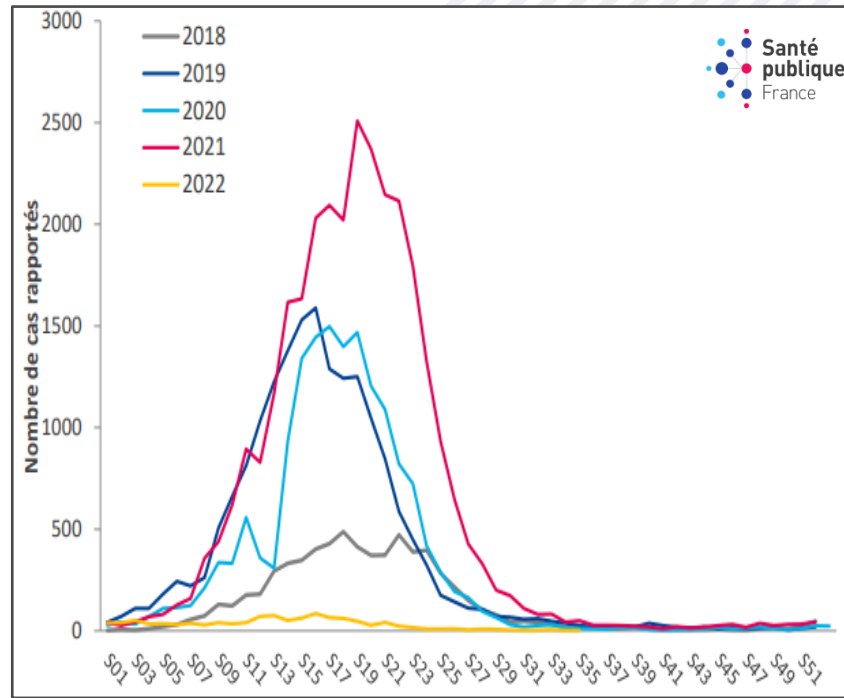
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DENGUE , 3 LEVELS OF THREAT IN FRANCE :

1- OUTBREAKS AREA = LA REUNION ISLAND (INDIAN OCEAN)

→ ONGOING OUTBREAK SINCE 2018

2018-2022 weekly distribution
of reported DEN-V cases :



Point épidémiologique Dengue, La Réunion, 22 Septembre 2022

2- ENDEMO-EPIDEMIC AREAS = FRENCH ANTILLES IN THE CARIBBEAN'S

→ FREQUENT OUTBREAKS OF VARYING INTENSITY, INVOLVING ONE OR MORE OF THE 4 DEN-V

3- NON ENDEMIC AREA = METROPOLITAN FRANCE

→ IMPORTED CASES → AUTOCHTHONOUS CASES

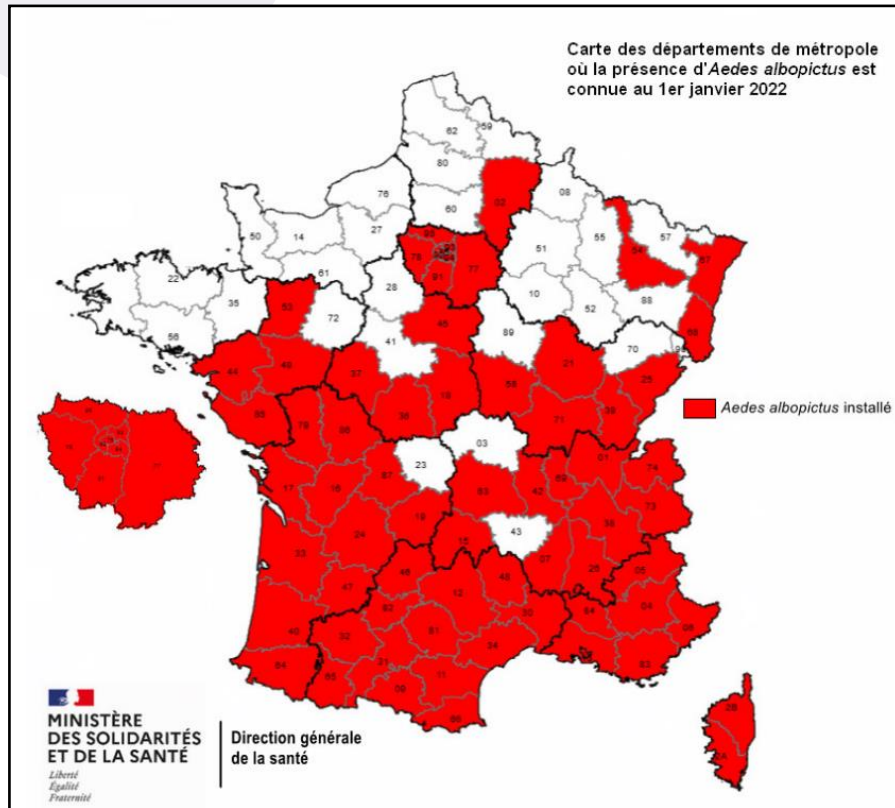


DENGUE : THREATS IN METROPOLITAN FRANCE

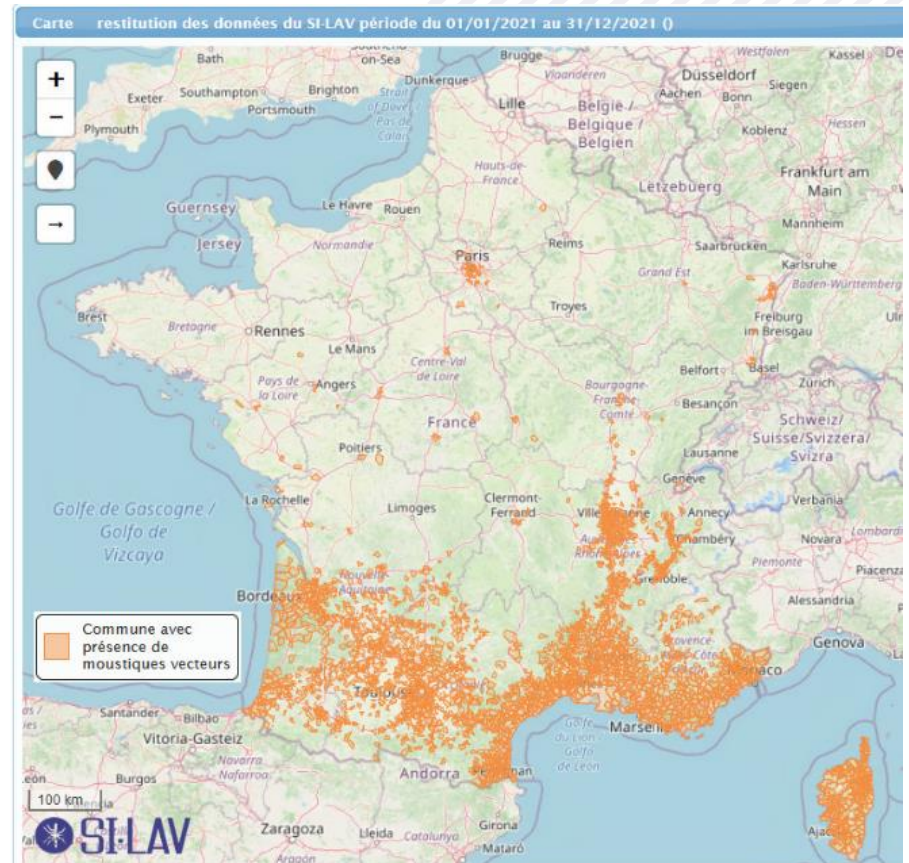
Metropolitan France

Main vector = Aedes albopictus

French departments (NUTS-3 level, in red)
with presence of *Aedes. albopictus*



Municipalities (in orange)
with presence of *Aedes albopictus*



<https://solidarites-sante.gouv.fr/sante-et-environnement/risques-microbiologiques-physiques-et-chimiques/especes-nuisibles-et-parasites/article/cartes-de-presence-du-moustique-tigre-aedes-albopictus-en-france-metropolitaine>

THREAT ASSOCIATED TO IMPORTED CASES

DENGUE ←

CHIKV ←

ZIKA ←

Table 2. Dengue and chikungunya autochthonous transmission events in France between 2010 and 2018.

Year	Locality	Département	Virus	Number of autochthonous cases	Identification of the imported source case	Ref.
2010	Nice	Alpes-Maritimes	Dengue 1	2	Yes	[18]
2010	Fréjus	Var	Chikungunya	2	Yes	[17]
2011			Absence of autochthonous transmission event			
2012			Absence of autochthonous transmission event			
2013	Venelles	Bouches-du-Rhône	Dengue 2	1	Yes	[16]
2014	Aubagne	Bouches-du-Rhône	Dengue 2	2	Yes	[42]
2014	Toulon	Var	Dengue 1	1	No	[42]
2014	Toulon	Var	Dengue 2	1	No	[42]
2014	Montpellier	Hérault	Chikungunya	12	Yes	[15]
2015	Nîmes	Gard	Dengue 1	7	Yes	[14]
2016			Absence of autochthonous transmission event			
2017	Le Cannet-des-maures (*)	Var	Chikungunya	11	Yes	[13]
2017	Taradeau (*)	Var	Chikungunya	6	Yes	[13]
2018	Saint-Laurent-du-Var	Alpes-Maritimes	Dengue 2	5	No	[8]
2018	Nîmes	Gard	Dengue 1	1	Yes	[8]
2018	Clapiers	Hérault	Dengue 1	2	No	[8]

(*) These transmission foci were geographically separate but an epidemiological link was established.

Preliminary report of an autochthonous chikungunya outbreak in France, July to September 2017

2019	Vallauris	Alpes Maritimes	Dengue	7	←
2019	Caluire	Rhône	Dengue	2	←
2019	Hyères	Var	Zika	3	←
2020	Cessenon sur Orb	Hérault	Dengue	3	←
2020	Croix-Valmer	Var	Dengue	3	←
2020	Nice	Alpes Maritimes	Dengue	7	←
2021	Nice	Alpes Maritimes	Dengue	1	←
2021	Montpellier	Hérault	Dengue	1	←

Éléonore Calba¹, Mathilde Guerbois-Galla^{1,2}, Florian Franke¹, Charles Jeannin¹, Michelle Auzet-Cailaud¹, Gilda Grand^{1,3}, Lucette Pigaglio¹, Anne Decoppet¹, Joel Weicherding¹, Marie-Christine Savail^{1,4}, Manuel Munoz-Riviero¹, Pascal Chaud¹, Bernard Cadiou¹, Lauriane Ramallo^{1,5}, Pierre Fournier¹, Harold Noël^{1,6}, Xavier De Lamballerie¹, Marie-Claire Paty^{1,6}, Isabelle Leparc-Goffart^{1,3}

Vector-borne transmission of Zika virus in Europe, southern France, August 2019

Sandra Giron¹, Florian Franke¹, Anne Decoppet¹, Bernard Cadiou¹, Thierry Travaglini¹, Laurence Thirion¹, Guillaume Durand^{1,5}, Charles Jeannin¹, Grégory L'Ambert¹, Gilda Grand^{1,6}, Harold Noël¹, Nelly Fournet¹, Michelle Auzet-Cailaud¹, Christine Zandotti¹, Samer Aboukalis¹, Pascal Chaud¹, Saby Guedj¹, Lakri Hamouda¹, Xavier Naudot¹, Anne Ovière¹, Clément Lazarus¹, Henriette de Valk¹, Marie-Claire Paty¹, Isabelle Leparc-Goffart^{1,3}

Dengue serosurvey after a 2-month long outbreak in Nîmes, France, 2015: was there more than met the eye?

Tiphanie Succo^{1,2}, Harold Noël^{1,3}, Birgit Nikolay^{1,4,5}, Marianne Maquart¹, Amandine Cochet¹, Isabelle Leparc-Goffart¹, Olivier Catelinois¹, Henrik Salje^{1,4,5}, Camille Pelat¹, Perrine de Crouy-Chanel¹, Henriette de Valk¹, Simon Cauchemez^{1,4,5}, Cyril Rousseau¹

From importation to autochthonous transmission: Drivers of chikungunya and dengue emergence in a temperate area. F Jourdain, D Roiz, H de Valk, H Noël, G L'Ambert, F Franke, MC Paty, A Guinard, JC Desenclos, B Roche. *PLoS Negl Trop Dis*. 2020

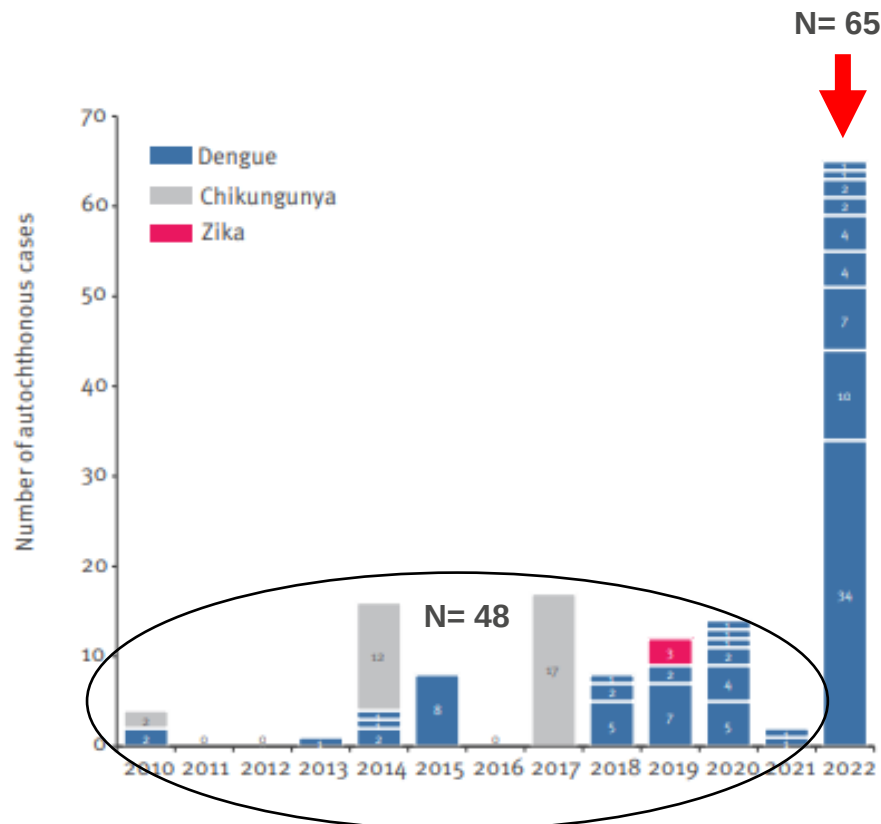
DENGUE, FRANCE : SEASON 2022

Internal use

➔ 2022: occurrence of an unusual number of outbreaks of autochthonous dengue fever in the south of France :

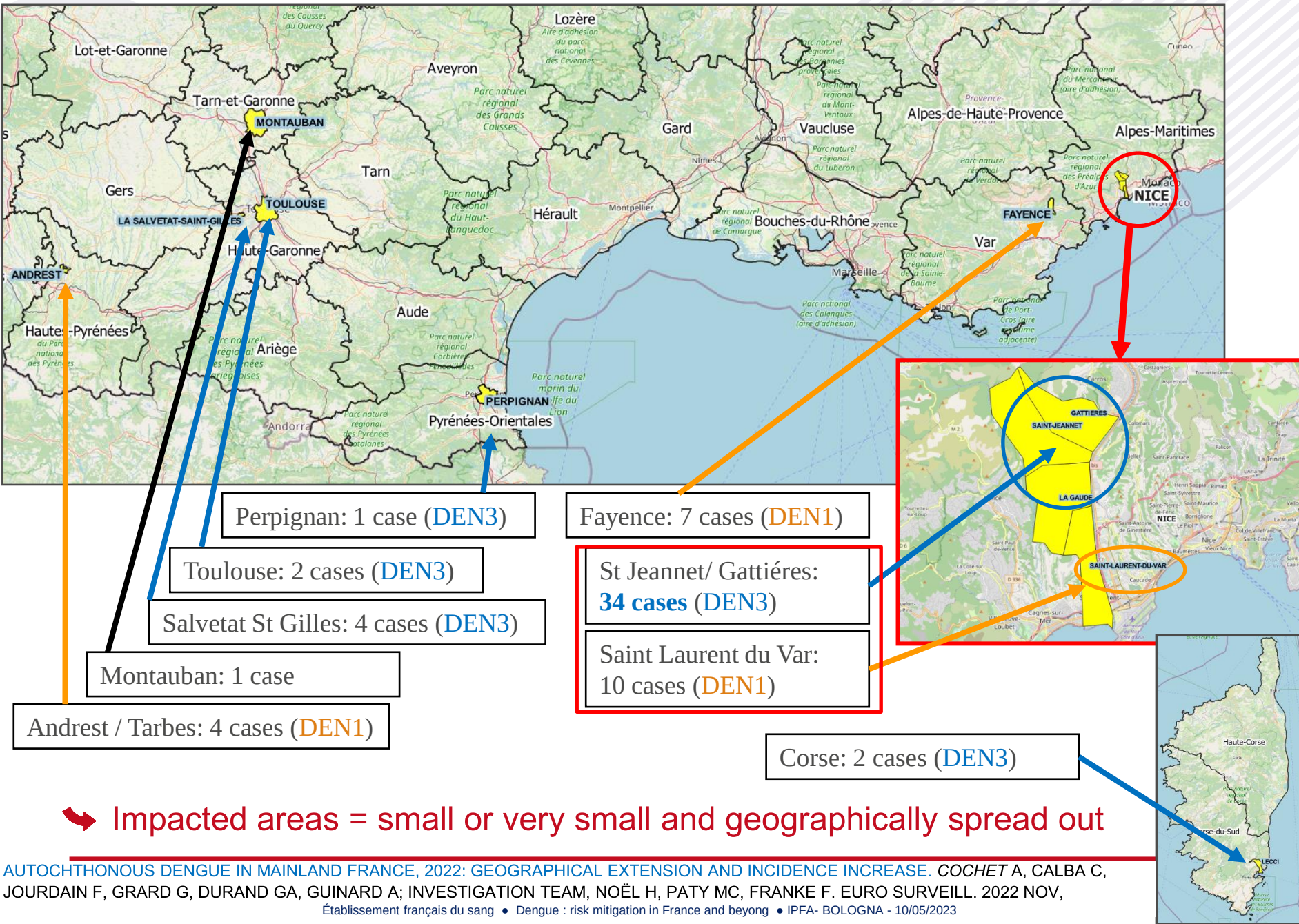
FIGURE 1

Distribution of arbovirus autochthonous events in mainland France, 2010–2022



AUTOCHTHONOUS DENGUE IN MAINLAND FRANCE, 2022: GEOGRAPHICAL EXTENSION AND INCIDENCE INCREASE. COCHET A, CALBA C, JOURDAIN F, GRARD G, DURAND GA, GUINARD A; INVESTIGATION TEAM, NOËL H, PATY MC, FRANKE F. EURO SURVEILL. 2022 NOV,

FRANCE, DENGUE, SEASON 2022 : 65 CASES DIVIDED IN 9 CLUSTERS

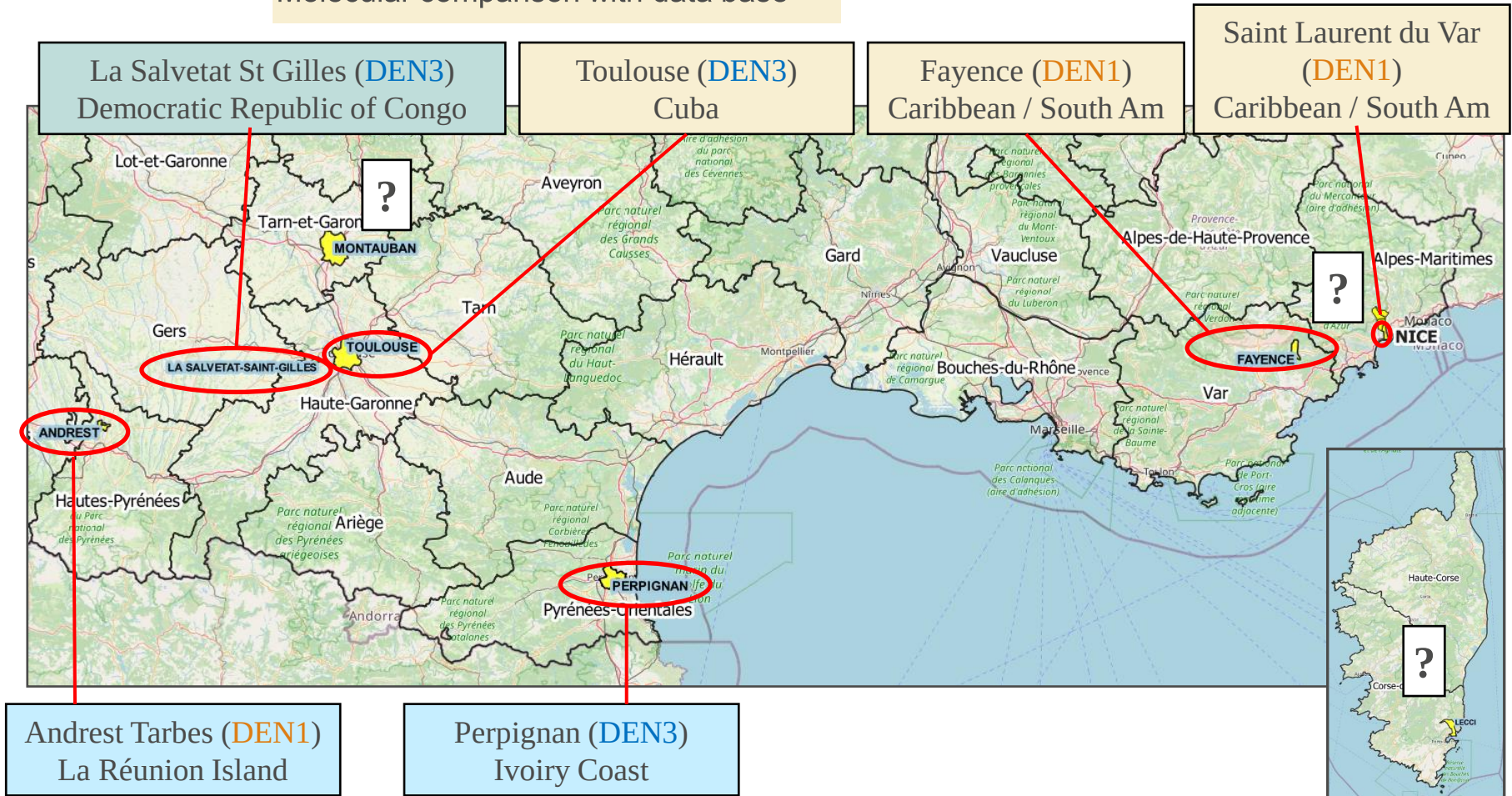


➡ Clusters due to distinct introductions by imported cases

Imported case identified & confirmed by strains comparison

Imported case identified

Molecular comparison with data base



➡ Only 1 cluster associated to return from French overseas impacted territories

Autochthonous cases of arboviruses transmitted by *Aedes*

Preventive measures for dengue transmission by blood products

Aims :

To ensure blood safety for recipients

To maintain quantitative & qualitative self-sufficiency

- Measures proportionate to the risks & to the context
- Can be adapted to the evolving situation

Preventive measures decided by Ministry of Health (MoH):

Based on the recommendations of an independent transdisciplinary expert committee for SoHO security of the High Council for Public Health (HCSP) = Secproch.

Criteria for implementation of measures in French territories :

- Non endemic area (low viral circulation) = one confirmed or possible human autochthonous case.
- Endemic or endemo-epidemic area = notification of epidemic level by local administrative authorities.

MoH alerts to SoHO's establishments :

All autochthonous cases requiring entomological investigations +/- vector control intervention.

Determination of the at risk area :

- Outbreak context = the entire affected area (ex La Réunion island)
- Sporadic autochthonous cases = depending on the mosquito's flight area = at least 2x vector control intervention perimeter (300 m radius around the case(s)) or a district of a city, or a municipality.

Determination of the at risk period :

- Start = 2 days (estimated duration of pre-symptomatic viremia) prior to the onset of symptoms of the first case.
- End = 45 days (time to observe a secondary case) after the end of symptoms of the last case.

MEASURES TO PREVENT TTI BY DENGUE VIRUS

A- In Affected areas :

A-1 : In case of sporadic cases → absence or low impact on blood supply

- Temporary cessation of blood collection (donors are deferred until the end of the alert)

A-2 : In case of large clusters or epidemics → Impact on blood supply

- NAT screening in routine labs using CE-marked assays



Cobas 8800- Roche



Panther system- Grifols

ID-NAT screening
in La Réunion island
since June 2018

B- In not affected areas :

- 28 days deferral after return for travellers having stayed (at least 1 night) in an affected areas

C- Pathogens reduction method (Intercept Blood System, Amotosalen+UVA) :

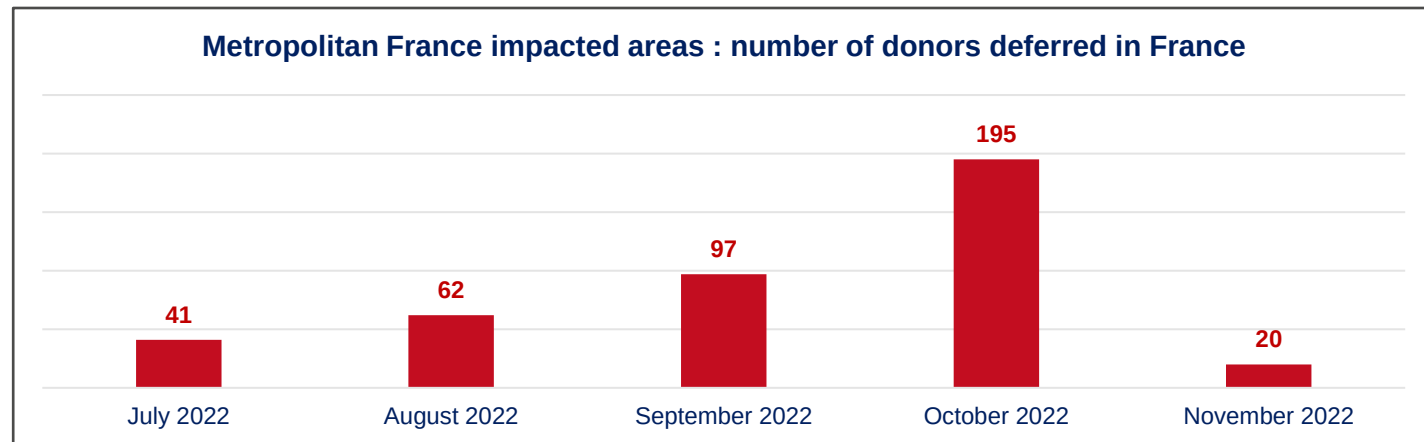
- Since 2005 in overseas territories and since 2017 in mainland France for platelets concentrates

DENGUE IN FRANCE AND BLOOD SAFETY : WHAT HAS BEEN DONE DURING THE LAST DECADE ?

➡ Measures were proportionated according to the epidemiological situation :

A : in metropolitan France :

- Main measure = 28 days deferral for donors who have stayed in affected areas
- No severe impacts on blood supply (in 2022, 415 French donors were deferred due to the local transmissions in the South of France).



- Capacity to deal with larger events (affecting large cities,...) using NAT screening (do date never implemented in metropolitan France).

B : in overseas territories :

- NAT screening implemented in overseas territories, still ongoing in the Réunion Island

Autochthonous cases of dengue in metropolitan France in 2022

Impact in others countries

Questionnaire to the EBA-EID Monitor members

Survey dengue, France 2022

Participants:

Among the 26 EID monitor members, 17 countries have responded (including 15 Europeans countries + USA & Australia)

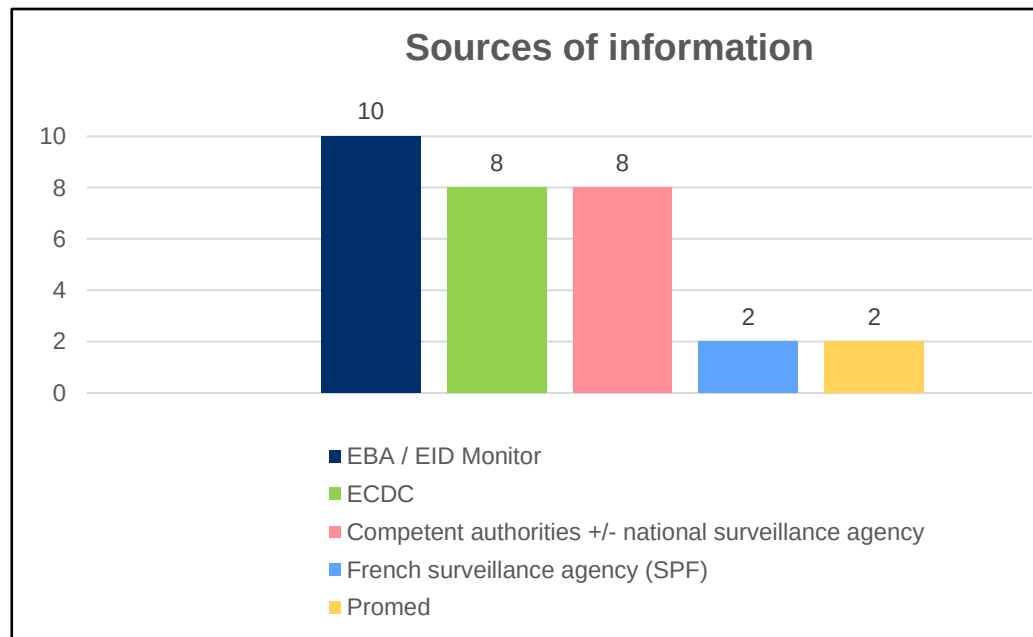
Question 1 : Do you defer donors returning from dengue endemic areas ?

Yes (1 month or 28 days) = 15/17

No = 2/16 (1 European country and 1 non European country)

Question 2 : Have you been informed of autochthonous cases in metropolitan France in 2022 ? and by which source of information ?

All were informed, 8/17 countries reported to have 1 source of information, others ≥ 2



Survey dengue, France 2022

Question 3 : Have you implemented measures for travellers who stayed in 2022 in the metropolitan French impacted areas ?

Yes = 13/17

No = 4/17 : - 2 european countries and 2 non european countries

- Reasons = risks of infection for travellers + morbidity after transfusion estimated as negligible
- Decision based on a risk assessment (2/4),

For those having implemented measures for travellers who stayed in the French impacted areas (n= 13)

Question 4 : What were the criteria used in your country to implement preventive measures ?

- One autochthonous case : 8/13
- Several clusters : 1/13
- Risk assessment of the situation : 3/13
- No criteria formalized: 1/13

➡ Reflection about a common list of criteria for risk assessment and, if possible, a decision making algorithm

Question 5 : How did you define the impacted geographical area ?

- Municipalite = Village / cite : 1/13
- French department (NUTS3 level) : 11/13
- Southern part of France : 1/13

➡ NUTS-3 level = the most efficient size for blood donors deferral in foreign countries

Survey dengue, France 2022

For those having implemented measures for travellers who stayed in the French impacted areas (n= 13)

Question 6 : If you stopped the preventive measure how did you define the end of the risk exposure period ?

- 28 days after the last autochthonous case reported : 1/13
- End of mosquitoes activity or winter period : 7/13
- Case review after 1 year & absence of new case : 1/13
- Deferral all year round: 3/13

↪ End of mosquitoes activity (end of November)

Question 7 : Strategy for the next season : Will you defer donors who have been in these areas once the mosquito season starts in 2023? Do you still defer ?

No = 6/13

Yes = 7/13 (including 2 countries reporting deferral all year round /NUTS-3 level)

↪ Surprising ! Metropolitan France is not endemic for dengue

Question 8 : Can you estimate the number of donors who were deferred for this reason ?

- Impossible (defferal code common with other arboviruses) : 9/13
- Low impact on blood supply : 4/13
(ex : Netherland n=16; Slovenia <50 , Belgium n=71)

↪ VERY LOW impact on blood supply in foreign countries



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CONCLUSIONS

CONCLUSION 1 : IN FRANCE

- ➡ Metropolitan France is not an endemic area for dengue in contrast to Overseas
 - Measures interrupted when mosquitoes activity stopped
 - No proactive measures required in previously affected areas for 2023
- ➡ No case of TTI caused by arboviruses reported by the national haemovigilance survey
- ➡ NAT screening can be implemented in case of wide circulation of viruses transmitted by *Aedes sp* mosquitoes (dengue, chikungunya and zika).

CONCLUSION 2 : FOR FOREIGN COUNTRIES

- The questionnaire revealed heterogeneity in practices mostly explained by difference in risk assessment
- Points for improvement in the implementation of the preventive measures in non-affected countries :
 - To establish a common list of criteria for risk assessment,
 - To recommend an optimal geographical definition for affected areas,
 - To define criteria for stopping measures and agree on actions for the next season.
- Few (n=18) reported TTI-dengue cases worldwide
 - TTI risk requires further investigations

ACKNOWLEDGEMENTS

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Dr Gilda Grard

THANK
YOU FOR
YOUR
ATTENTION



EID Monitor members : Wolfgang Mayr (Chair), Rynne Lieshout (Secretary General), Dragoslav Domanovic (EBA), Anthea Cheng Veronica Hoad & Clive Seed (Australia), Christof Jungbauer (Austria), Veronique Van Gaever & Ivan de Bouyalsky (Belgium), Steven Drews (Canada), Christian Erikstrup (Denmark), Riikka Lehtisalo & Susanne Ekblom-Kullberg (Finland), Knut Gubbe (Germany), Constantina Politis (Greece), Sveinn Gudmundsson (Iceland), Ellen McSweeney & Niamh O'Flaherty (Ireland), Ilaria Pati, Daniele Prati (Italy), Andree Heinrich (Luxembourg), Denise Radmilli (Malta), Mario Muon (Portugal), Valentina Filipović Samec (Slovenia) Salvador Oyonarte Gómez (Spain), Jonas Nordberg (Sweden), Tiziana Janner (Switzerland), Lisa Jarvis (UK), Susan Stramer Rika Reik & Louis Katz (USA).