

**REPORT from Physicians in the Crop-Sprayed Villages regarding Dengue-Zika, microcephaly, and mass-spraying with chemical poisons**

**Main points:**

**1-Dengue epidemic in Brazil persists endemically (on an ongoing basis) due to the marginalisation and misery of millions of people, especially in Northeast Brazil. On top of that, Zika virus, a similar disease although more benign, is now spreading.**

**2. A dramatic increase of congenital malformations, especially microcephaly in newborns, was detected and quickly linked to the Zika virus by the Brazilian Ministry of Health. However, they fail to recognise that in the area where most sick persons live, a chemical larvicide producing malformations in mosquitoes has been applied for 18 months, and that this poison (pyroproxyfen) is applied by the State on drinking water used by the affected population.**

**3. Previous Zika epidemics did not cause birth defects in newborns, despite infecting 75% of the population in those countries. Also, in other countries such as Colombia there are no records of microcephaly; however, there are plenty of Zika cases.**

**3. The pyroproxyfen being used (as recommended by WHO) is manufactured by Sumimoto Chemical, a Japanese subsidiary of Monsanto.**

**4. Brazilian doctors (Abrasco) are claiming that the strategy of chemical control is contaminating the environment as well as people, that it is not decreasing the amount of mosquitoes, and that this strategy is in fact a commercial manoeuvre from the chemical poisons industry, deeply integrated into Latin American ministries of health as well as WHO and PAHO.**

**5. Massive spreading using planes, as the governments of Mercosur are considering, is criminal, useless, and a political manoeuvre to simulate that actions are taken. The basis of the progress of the disease lies in inequality and poverty, and the best defence are community-based actions.**

**6. The last strategy deployed in Brazil, and which might be replicated in all our countries, is the use of GM mosquitoes —a total failure, except for the company supplying mosquitoes.**

**Introduction**

Along with the chronic epidemic of Dengue in Brazil (almost endemic in Northeast Brazil, just like the millions of people living in poverty and marginality), an outbreak of Zika, a virus disease also transmitted by the Aedes mosquito, has been taking place for 9 months.

In Pernambuco, nearly 4,000 children born in 2015 show congenital

malformations, especially MICROCEPHALY (heads smaller than usual). The Brazilian Ministry of Health promptly claimed that it was a consequence of the infection caused by the Zika virus(1)

**Discovered in 1947** in the Zika forest in Uganda, the ZIKA virus is an arbovirus of the genus Flavivirus, similar to the virus causing dengue, yellow fever, Japanese encephalitis, West Nile fever, and St. Louis encephalitis. First human cases of Zika infection were described during the **1960's** in Africa; after that there were outbreaks in Southeast Asia and Oceania(2).

Up until **2007**, when a large epidemic appeared in Yap —an island in the Pacific Ocean (Micronesia)— Zika infections had been limited to sporadic cases or small-scale epidemics. During the Yap epidemic, an estimated three-quarters of the local population had been infected. (2)

The expanding area of distribution of ZIKA turned Zika fever into an emerging disease, confirmed by the current epidemic affecting French Polynesia since **October 2013** and New Caledonia, with reported cases since late 2013. These Pacific Islands are characterised by the large number of mosquitoes that proliferate especially among native villages. (2)

**In May 2015**, the World Health Organization reported native cases identified in Brazil. Last December, the Ministry of Health estimated that 440,000 to 1,300,000 suspected cases of Zika virus disease had occurred in Brazil during 2015. (2)

The true **incidence** of Zika fever is unknown, due to the fact that its clinical manifestations imitate the infection caused by Dengue virus, and to the lack of simple and reliable lab tests. In endemic areas, epidemiological studies show a high prevalence of antibodies against ZIKA. For example, the 2007 Yap epidemic resulted in an attack rate of 14.6/1,000 inhabitants, and a seroprevalence of 750/1000 inhabitants after the epidemic (i.e. 750/1000 had the infection without developing the disease.) The infection appears to be symptomatic only in 18% of cases. (2-3)

It usually happens as a flu-like syndrome, often confused with other arbovirus infections such as Dengue or Chikungunya. The typical form of the disease is associated with low-grade fever (between 37.8 °C and 38.5 °C), arthralgia, especially of small joints in hands and feet, myalgia, headache, retro-orbital pain, conjunctivitis, and maculopapular rash. Digestive problems (abdominal pain, diarrhoea, constipation), ulceration of mucous membranes (thrush), and itching can be rarely observed. Asthenia after infection seems to be common.(2)

On December 2013, during the Zika epidemic in French Polynesia, an increase in cases of Guillain Barre syndrome, a neurological paralysis linked to immune disruption generated by viruses, vaccines and/or environmental toxins, was reported. (4)

### **Zika in Brazil**

On January 2016, the Brazilian Association for Collective Health (ABRASCO) published a Technical Note and Open Letter to the People of Brazil(1), questioning the linear analysis carried out by the Ministry of Health of Brazil, which linked the emergent congenital malformations to Zika, leaving aside other factors that can have an influence on the problem, and minimising the fact that the widespread epidemic in the Pacific and the current epidemic in Colombia, resulted in no cases of malformations, much less microcephaly. Above all, the role of the chemical model for vector control is ignored. This model, implying the mass usage of chemical poisons in order to reduce or

eradicate the presence of mosquitoes, has been carried out in the most vulnerable areas of Northeast Brazil for 40 years, whilst the epidemics, poverty, social marginalisation, deforestation, and climate change have multiplied.

Since the second half of 2014, the Brazilian Ministry of Health<sup>(5)</sup> stopped using temephos (an organophosphate agrototoxic to which *Aedes* larvae became resistant) as larvicide, massively incorporating the poison Pyriproxyfen, commercially known as Sumilarv and manufactured by Sumimoto Chemical, a Japanese company associated to or subsidiary of Monsanto in Latin America (1,5).

The spatial distribution by place of residence of mothers of children born with microcephaly shows a higher concentration in the poorest areas of Northeastern Brazil, with poor urbanisation and inadequate sanitation. Large areas of Recife and other cities in Northeastern Brazil, with intermittent water supply, led these communities to store water at home in an unsafe manner, due to the inadequate protection of tanks intended for human consumption, leading to very favourable conditions for the *Aedes Aegypti* mosquito, by creating a breeding ground which should not exist and that can be mechanically removed.<sup>(1)</sup>

Pyriproxyfen is applied directly by the Brazilian Ministry of Health on drinking-water reservoirs used by the people of Pernambuco, where the proliferation of the *Aedes* mosquito is very high (a situation similar to the Pacific Islands).<sup>(6)</sup> This poison, recommended by the WHO, is a growth inhibitor of mosquito larvae, which alters the development process larva-pupa-adult, thus generating malformations in developing mosquitoes and causing their death or incapacity. It is analogous to the insect juvenile hormone or juvenoids, which has the effect of inhibiting the development of adult insect characteristics (for example wings, mature external genitalia) and the reproductive development, maintaining an "immature" aspect (nymph or larvae), which means that it acts by endocrine disruption and that is teratogenic.

Malformations detected in thousands of children from pregnant women living in areas where the Brazilian state added pyriproxyfen to drinking water is not a coincidence, even though the Ministry of Health places a direct blame on Zika virus for this damage, while trying to ignore its responsibility and ruling out the hypothesis of direct and cumulative chemical damage caused by years of endocrine and immunological disruption of the affected population. Doctors from the Brazilian Association for Collective Health (ABRASCO) demand that urgent epidemiological studies taking into account this causal link be carried out, especially when among 3,893 cases of malformations confirmed until January 20, 2016, 49 children have died and only five of them were confirmed to have been infected with Zika<sup>(1)</sup>.

Many policy-makers, even PAHO and OMS, epidemiologists, public health experts, chemists and politicians in general easily forget that human beings, every one of us, have deployed embryonic development processes in which we go through very different stages. The evolution from zygote to embryo, from embryo to foetus and from foetus to newborn, is not far from the development process of the mosquito affected by pyriproxyfen. They also very easily try to ignore that in humans, 60% of our active genes are identical to those of insects such as the *Aedes* mosquito. And it is much more confusing when they are "advised" by experts from Foundations and chemical insecticides companies (for ex.: Fundación Mundo Sano and Chemotecnica), or when decision makers from the Ministry of Health are former employees of global companies manufacturing and selling poisons for "domestic purposes."

Brazil fumigates against adult *Aedes* using Malation, a carcinogenic organophosphate compound according to WHO. Paraguay acquired thousands of tonnes of clorpyrifos in

order to kill mosquitoes, although we know that clorpyrifos affects the developing brain of foetus and newborns. In Argentina, vector "control" is carried out using pyrethroids, which is a little less toxic but banned in Europe because of its effect on people.

For doctors in ABRASCO, the problem is that behind these decisions we find the World Health Organization and the Pan American Health Organization, holding "Pesticides" committees that maintain no dialogue with the environmental, sanitation and health promotion committees. In these agencies, the committees prescribing the use and regulation of the purchase of supplies for vector control for the entire world are imperial. It is these agencies who convince and endorse the tendering processes for national governments.(1)

### **How to face these diseases**

The hegemonic strategies for facing these diseases **spread** by mosquitoes and **multiplied** by poverty, lack of sanitation, excreta, lack of safe water, are vertical intervention programs, while chemical poisons (larvicides and adulticides) demobilise the population by relying on the success of the poison's properties, which in turn makes them sick, kills the natural predators of mosquitoes and generates the need for repeated applications that only benefit the chemical poisons companies.

A vast amount of independent scientific data shows how this strategy is defective and that it is only useful for taking photographs of the rulers in office. Community-based strategies including social participation and mobilisation yield better results against the impending epidemic.(7,8,9) The steps that lead to defeating the disease are linked to social justice and equity. Clearly, the social sectors affected by Dengue and Zika are the poorest and most deprived of services and rights.

In some very specific moments, massive aerial spraying over inhabited areas might be advisable, but their effects are limited only to decreasing the amount of adult mosquitoes during 2-3 days, which can be useful when colder days arrive (note that the Aedes mosquito is immobilised and does not reproduce nor feed with temperatures below 23 °C.)

Controlled applications around houses in the first case (focus control) are useful to decrease the progress of the epidemic, but massive sprayings over entire cities requires an analysis of health costs (damage to human health and the ecosystem) vs health benefits (control and mitigation of the epidemic), which cannot be justified in any "sanitary" way, despite being used by governments and the hegemonic press to simulate that measures are taken to defend the health of people.

Our experience from the Dengue epidemic in Cordoba in 2009, in which we had direct participation, shows that the distribution of cases corresponds to the same distribution of infant mortality in 2007 and the distribution of the population with higher unmet basic needs, namely: lack of housing, jobs, education and health, which can be seen on the maps attached.

Mass spraying is not the solution to a problem; it's merely generating a business within a problem.

### **New strategy: GM mosquitoes (new business)**

Within this framework, there is a new health intervention strategy in Brazil, which they

will try to expand to the entire region: GM mosquitoes.

The English company Oxitec sells male GM mosquitoes, supposedly in order to decrease the *Aedes* population. A lethal gene is inserted in those mosquitoes, which is transmitted to the offspring, causing death to larvae if it is not blocked by an antibiotic (tetracycline).

The goal is that millions of male mosquitoes are released to mate with wild females, so that their eggs result in larvae which dies spontaneously.(10,11)

The business is to sell those lab mosquitoes to governments, and then people need to "protect" those mosquitoes because, supposedly, it is neither necessary nor advisable to remove the sites where mosquitoes breed.

Currently in Brazil nearly 15 million GM mosquitoes have been released, and the failure is complete. Where field tests were carried out, less than 15% of larvae were transgenic, that is to say... wild females are not accepting the English mosquito from Oxitec. The response: increasing the release in poor areas. (10)

Also, we must take into account that the biology of the disease shows that the female only "stings" when it's pregnant and generating eggs after being fertilised by a male; it does it in that state and only then, because it needs blood components in order to develop the eggs. So, if millions of male mosquitoes are released, there will be many more fertilised females looking to suck the blood of mammals, thus increasing the spreading of the disease from infected people to healthy people!

### **In the face of the Zika threat, mass sprayings in Mercosur**

The governments of Mercosur are causing alarm with the threat of Zika and microcephaly, proposing "more of the same." The agribusiness is offering the services of the "Soya Air Force" to be used for spraying over cities and villages.(12) Monoculture, the massive use of pesticides, deforestation, destruction of flora and fauna, ecological imbalance, climate change, inequality, those factors are not considered as a cause of the problem.

To social inequality, these epidemics will add health inequalities, and governments with their chemical attacks will generate environmental inequality.

#### References

- 1- nota técnica e carta aberta à população Microcefalia e doenças vetoriais relacionadas ao *Aedes aegypti*: os perigos das abordagens com larvicidas e nebulização química - fumacê. Janeiro de 2016. GT Salud y Ambiente. Asociación Brasileña de Salud Colectiva. ABRASCO. <https://www.abrasco.org.br/site/2016/02/nota-tecnica-sobre-microcefalia-e-doencas-vetoriais-relacionadas-ao-aedes-aegypti-os-perigos-das-abordagens-com-larvicidas-e-nebulizacoes-quimicas-fumace/>
2. Hennessey M, Fischer M, Staples JE. Zika Virus Spreads to New Areas — Region of the Americas, May 2015–January 2016. *MMWR Morb Mortal Wkly Rep* 2016;65(Early Release):1–4. DOI: <http://dx.doi.org/10.15585/mmwr.mm6503e1er>
3. [Duffy MR<sup>1</sup>](#), [Chen TH](#), [Hancock WT](#), [Powers AM](#), [Kool JL](#), [Lanciotti RS](#), [Pretrick M](#), [Marfel M](#), [Holzbauer S](#), [Dubray C](#), [Guillaumot L](#), [Griggs A](#), [Bel M](#), [Lambert AJ](#), [Laven J](#), [Kosoy O](#), [Panella A](#), [Biggerstaff BJ](#), [Fischer M](#), [Hayes EB](#) **Zika virus outbreak on Yap Island, Federated States of Micronesia** *N Engl J Med*. 2009 Jun 11;360(24):2536-43. doi: 10.1056/NEJMoa0805715.
4. Oehler E, Watrin L, Larre P, Leparç-Goffart I, Lastère S, Valour F, Baudouin L, Mallet HP, Musso D, Ghawche F. Zika virus infection complicated by Guillain-Barré syndrome – case report, French Polynesia, December 2013. *Euro Surveill*. 2014;19(9):pii=20720. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId= 07202>.
5. Sumitomo Chemical and Monsanto Expand Weed Control Collaboration to Latin America. Sumimoto Chemical News Release December 09, 2014.

<http://www.sumitomo-chem.co.jp/english/newsreleases/docs/20141209e.pdf>

6. Orientações técnica para utilização do larvicida pyriproxyfen (0,5 G) no controle de *Aedes aegypti*. Ministério da Saúde.

<http://u.saude.gov.br/images/pdf/2014/maio/30/Instrucoes-para-uso-de-pyriproxyfen-maio-2014.pdf>

7. Caprara, Andrea et al. "Entomological Impact and Social Participation in Dengue Control: A Cluster Randomized Trial in Fortaleza, Brazil." *Transactions of the Royal Society of Tropical Medicine and Hygiene* 109.2 (2015): 99-105. PMC. Web. 3 Feb. 2016.

8. Espinoza-Gomez, F, H Moises, and R Coll-Cardenas. "Educational Campaign versus Malathion Spraying for the Control of *Aedes Aegypti* in Colima, Mexico." *Journal of Epidemiology and Community Health* 56.2 (2002): 148-152. PMC. Web. 3 Feb. 2016.

9. Andersson, Neil et al. "Evidence Based Community Mobilization for Dengue Prevention in Nicaragua and Mexico (Camino Verde, the Green Way): Cluster Randomized Controlled Trial." *BMJ: British Medical Journal* 351 (2015): h3267. PMC. Web. 3 Feb. 2016.

10. Helen Wallace. Mosquitos Genéticamente Modificados: Preocupaciones actuales. TWN Biotechnology & Biosafety Series No. 15. Rapal Uruguay. Web. 3 Feb 2016.

<http://www.rapaluruaguay.org/transgenicos/Mosquitos%20Gen%20Geneticamente%20Modificados%20%20parte%20I%20y%20II.pdf>

11. Genewatch UK. Marzo 2015. Mosquitos Genéticamente Modificados de Oxitec: ¿Un enfoque creíble para abordar el problema del dengue?. Web 03 Feb 2016.

[http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/Mosquitos\\_Geneticamente\\_Modificados\\_de\\_Oxitec.pdf](http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/Mosquitos_Geneticamente_Modificados_de_Oxitec.pdf)

12. La Nación. Alistan unos 135 aviones para fumigar Mercosur. Web 3 feb 2016.

<http://www.lanacion.com.py/2016/02/02/alistan-unos-135-aviones-para-fumigar-mercosur/>

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