



# Impact of a Parental Public Health Blog on the Functioning of the New French School in Beijing

Korach JM<sup>1\*</sup>, Stievenard RN<sup>2</sup>, Li RN<sup>3</sup>, Baer M<sup>3</sup>, C Fleischel, Lebihain F<sup>4</sup> and Coillot A<sup>4</sup>

<sup>1</sup>Intensive Care Unit, General Hospital, France

<sup>2</sup>Lycée Français International de Pékin, China

<sup>3</sup>University Hospital Raymond Poincaré, France

<sup>4</sup>Inter-Mutuelles Assistance, France

## Abstract

In 2015, The High School of Changzhou (China) builds near chemical factories on the former ground of a factory of pesticides, was the object of a sanitary scandal, 500 children presenting cutaneous erythema and epistaxis attributed to toxic fumes. In May, 2016, the new French High school of Beijing opens its doors. The parental description of epistaxis immediately activated a blog, finding arbitrarily a similarity with Changzhou, with for consequence the closure of a part of the structure and the appointment of a mission of independent French investigation, compound of a hospital doctor and a quality control engineer of the air, to analyze, a possible relation between observed clinical signs and ambient air.

**Keywords:** Social network; Parental medical blog; Ambient air; Toxicology; Economic consequences

## Introduction

Following a scandal involving Chinese companies that built stadiums and a high school on and with materials containing toxic industrial waste debris in Changzhou, with the appearance for 500 children, of clinical signs with type of skin allergies, epistaxis without any other clinical or statistical precision, an alert was widely reported by the press as early as April 2015 (CCTV, The Guardian, Financial Times). On 9 May 2016 the new French International High School of Beijing (LFIP Charles de Gaulle), located on the outskirts of the city (30 km from the city center), opens its doors to replace the former high school distributed on 3 sites. This structure includes 950 students from kindergarten to the senior classes. From the first days of operation of the new establishment, will appear reports of epistaxis and other cutaneous redness on the social network WeChat, a mobile text and voice messaging application developed by Chinese giant Tencent Holdings Limited, which also allows audio and video calls. The app is very popular, with 600 million members around the world including 240 million in China. The number of reports of "pathologies" considered similar to those in Changzhou, by Franco-Chinese families with a child enrolled in the LFIP, quickly spread, expressing doubts about the quality and safety of the construction of the new buildings. This situation is reported as of June 15, 2016 in the French written press [1] and in the internet press (Le Point, Le Parisien, Challenge, Capital, L'Express, L'Expansion) in the form of an ad-integrum retranscription of a message from Agence France Presse (AFP) entitled «China; scandal of toxic athletic tracks, closed factories» and two articles of 9 and 23 June 2016 on Asialyst «China: mysterious allergies to the new French high school in Beijing» and «China: Pollutants at the French high school in Beijing, the investigation continues.». During this initial period, the families began to report to the infirmary and to the management of the high school, in posteriori, all the events which they considered as pathological and potentially due to the materials used. This climate of suspicion, spreading like a trail of gunpowder with absenteeism among students, quickly required the creation of a "crisis" cell which mandates a Chinese laboratory as of May 13, 2016 to carry out air sampling for toxic total Volatile Organic Compounds (VOC) and BTEX (Benzene, Toluene, Ethylbenzene Xylene). The results showing values a little above the recommendation thresholds, at the contact of the class closets, in the gymnasium, the dojo and the auditorium it is carried out, within the framework of a strategy of application of the principles of maximum precautions, the dismantling of furniture and the closing of spaces for artistic and sporting activities. Given the gravity of the situation, the «Agence pour l'Enseignement du Français à l'Etranger (AEFE)» in Paris, the school's parent body,

## OPEN ACCESS

### \*Correspondence:

Korach JM, Intensive Care Unit,  
General Hospital, 79 avenue de Metz,  
51000 Châlons en Champagne, France,  
Tel: + 3332 641981;

E-mail: jmkorach@gmail.com

Received Date: 20 Apr 2020

Accepted Date: 07 May 2020

Published Date: 14 May 2020

### Citation:

Korach JM, Stievenard RN, Li RN,  
Baer M, C Fleischel, Lebihain F, et al.  
Impact of a Parental Public Health Blog  
on the Functioning of the New French  
School in Beijing. *Am J Allergy Asthma  
Immunol Res.* 2020; 1(1): 1001.

**Copyright** © 2020 Korach JM. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

decides to have an independent emergency expertise carried out by a two-member team including a doctor commissioned by Inter Mutuelles Assistance (IMA) and an air quality engineer (Burgeap Corporation), to assess the reality of the LFIP's indoor and outdoor environment on children's health.

## Material and Methods

This issue was complicated, with a specification that required 36 h to be able to face a meeting with the parents of students and give guidance on the toxicity or non-toxicity of the structure for the health of children. The second stage analyzed the pathological events (Adverse Events: AE) that occurred at the high school or that were subsequently reported by families since the opening (45 days) that were not comparable to the same period of 2015, because the school was then spread over three different sites in downtown Beijing. A call to the infirmary of the Lycée International Français de Shanghai, an institution of identical size opened since 1998, allowed us to obtain a sample of population comparable to that of the LFIP with the detail of the EI per day, can be related to allergic phenomena (oculo-nasal catarrh, erythema, pruritus) and especially epistaxis, the only clinical signs without any doubt.

In a second step are collected the family history if available, the delay between the start of clinical signs and the entry to the high school, the weather data of air temperatures between May 01 and June 30, 2016 (AccuWeather data). The frequency of AE recorded before and after the measures of closing of premises and dismantling of furniture are compared with each other, the results of the rare medical consultation reports are commented on in the strictest respect of the deontology. In order to give more power to the study, in a second step, we prospectively collected the AEs that appeared after the end of the work, between September 01 and 30, 2016 and then all the epistaxis recorded during the whole of the next school year and the daily temperatures 2016-2017. The results of the sampling performed by the air quality engineer are compared with the recommendations in force in public places. Statistical studies are carried out by a Chi-square test for the comparison of qualitative values and by a student t test for quantitative values with a 5% significance threshold:  $p \leq 0.05$  (Statview software).

## Results

### Population sample and medical results

The 2015 data recovered reported 14 epistaxis skin reactions pruritus at the three sites, without being able to determine age groups. Since May 10, 2016, school opening date, for 950 students, 559 of whom were in kindergarten plus primary, the school's infirmary has recorded 1,061 visits, for 480 children, 13 for epistaxis and 4 for erythema. Following the alert on toxic potentials, at the request of the LFIP management to the families, 59 children were the subject of a retrospective declaration of AE, going back up to three weeks before the opening of the school, with uncertain semiological descriptions, reported by the parents, without medical consultation for 47 of them. The average age of children included in the database is  $6.86 \pm 2.66$  years (extremes 3 to 15 years). The delay between the start of clinical signs and the start of high school is  $23.42 \pm 14.23$  days (extremes 21 to 45 days). The only identifiable comparator is the French high school of Shanghai in order to obtain the identical elements recorded in this structure over the same period. The school comprises the same population sample, with children from kindergarten to college for a total of 1,565 students, 786 of whom

are in kindergarten plus primary school. Only one element is clearly identified in both school structures (Beijing Shanghai): The epistaxis (an event reported by the family afterwards is doubtful in Beijing). The events recorded are strictly comparable in number affecting 95% primary kindergarten with, for the month of June, 1.78% of children with signs in Shanghai (without being able to obtain the age distribution) for 1.96% in Beijing of average age  $7.10 \pm 2.9$  years (extreme 3 to 15 years) ( $p=0.44$  ns). In Beijing, epistaxis occurred on average  $27.00 \pm 5.24$  days after entering high school (extremes 2 to 45 days) at an average temperature of  $30.9^\circ \pm 3.7^\circ$  (extremes  $22^\circ$  to  $34^\circ$ ). Thirteen children, including 12 who had been declared in retrospect, had a medical consultation including a "phone examination" the day after entering the school (child coughed for a month), in 50% of cases for epistaxis, 30% of cases for rhinopharyngitis table and 20% of cases of localized erythema. Brief hospitalization for edema, treated with antihistamines and corticosteroids is reported (no further results). Seven children seen in consultation had biological examinations of which four results in our possession, one with hyperleucocytosis at 11,000 WBC and normal CRP, one with 79% Prothrombin Time (PT), and an activate cephalin time at 35 sec for local laboratory standards between 21 sec and 34 sec with epistaxis, without medical follow-up, but a recommendation for a hematological consultation. For two children, the doctor found hypereosinophilia with prescription antihistamines. The examinations of the other three children are without abnormalities. The majority had no treatment. For two children, the parental demand for toxicity testing was high with lead and arsenic in one case (negative results). For 4 of the 13 consultations of family history of allergy are specified, a child presents an allergy to dog hair (known) with a notion of contact the day before, and one consultation attributed the erythematous reaction to a contact allergy of skin areas discovered after a «country walk». An adult consultation (teacher) for «discomfort» more important when he is in high school, nasal discharge, yellow expectoration (but normal biology) with antihistamine self-therapy. In two consultation reports, the feeling of discomfort is attributed to an "oxygen deficiency" due to toxic fumes from paints and new supplies making air composition below the safety threshold.

For the whole of the 2016-2017 school year, we recorded in 256 days of children's presence in the structure (excluding school holidays) 85 epistaxis, 73 spontaneous (68 children aged  $\leq 10$  years) and 12 trauma. In this group 167 days recorded a maximum temperature  $<25^\circ$  with 37 spontaneous epistaxis or 0.22 epistaxis/day and 89 days presented temperatures  $\geq 25^\circ$  with 36 spontaneous epistaxis or 0.40 epistaxis/day ( $p<0.0043$ ).

### Environmental factors

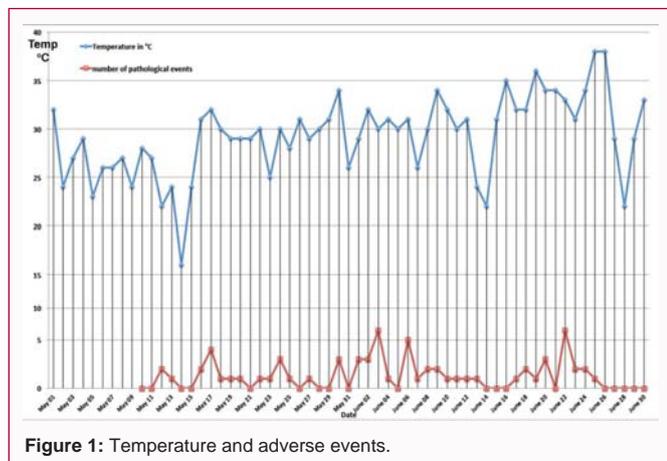
The school is bordered by a large area of fallow land of several hectares (property of a private investor), seeded with wild grasses, with the limit of plantations of trees especially of birch, sources of allergenic pollens especially at this time May-June. The wildland area and the field strip surrounding the football stadium are not-well-drained wetlands, which can be a reservoir of insect larvae, especially mosquitoes of which we note the strong "activity".

### Results environmental factors internal structure

This analysis by the Air Quality Engineer notes the poor quality of the air conditioning ventilation system, with dusty spaces, connections led to doubtful sealing, irregularly sealed by silicone seal. Electrostatic filters and removable artificial fibre filters are covered with mosquitoes, confirming the potential wet zone reservoir of the

**Table 1:** Air Temperature and Adverse events.

Temperature groups	Days number	AE Mean Number /Day
< 30°	20	0.65 ± 0.8
≥ 30°	32	1.68 ± 1.7



**Figure 1:** Temperature and adverse events.

previous paragraph.

## Discussion

Analysis of all AE potentially associated with a toxic cause per day, by increasing the daily number recorded in the infirmary, plus those reported in retrospect (dates may be unclear), shows 1.41 ± 1.6 AE/day open structures and 1.13 ± 1.3 AE/day after closure (p=0.5 ns). The comparative analysis of ambient temperatures vs. number of AE/day shows a significant increase in the number of events at temperatures above or equal to the 30° mean (p=0.014) (Table 1 and Figure 1).

Benign essential epistaxis is a common disease in children, rare before the age of two; present in 30% of subjects aged 2 to 5, and in 56% of children aged 6 to 10. Epistaxis usually stops spontaneously after puberty. Anterior bleeding is unilateral in 90% of cases (lesion of the Kiesselbach Plexus). Most often, there are simple traumatic risk factors (nose pick, sneezing, frequent snoring, and direct trauma) [2]. An infectious factor, nasal colonization by *Staphylococcus aureus* [3] is present in 57% of children with epistaxis, but no nasal swab has been performed. Favourable weather factors are clearly identified in the literature, high temperature [4], with prevalence from March to August, low ambient humidity generating dry nasal mucosa, air pollution [5]; these last three parameters apply strongly to the Beijing region (mean temperature of 30.4° ± 3.7°, extremes 16°/36°). In the LFIP data of May-June 2016, the ratio of children to epistaxis is even below the data in the literature.

The analysis of the subgroups, consisting of epistaxis which appeared before and after closure of the suspected toxic zones and dismantling of school furniture, shows a significant increase in the frequency observed (Table 2) after the removal of contact with the zones, 52.1% after closure and 47.8% before closure (p=0.045). Apart from the low levels of VOC which make it difficult to explain the clinical signs identified, the allergic manifestations can clearly be attributed to the environmental factor, since the installation in the premises took place during the full pollination period. The analysis of the data shows for 15 days (usual end of pollen release) an end of the reported cases. In addition, it is likely that erythematous plaques are, at least in part, a consequence of insect bites. Two children went to

**Table 2:** Epistaxis, college full open vs after partial enclosure.

	Full open	Partial enclosure	Total
Days Number	32 Days	12 Days	44
Epistaxis Number	11	12	23
	47.8%	52.1%	

**Table 3:** VOC measurement in ambient air.

	Values recorded in LFIP	Guide value µg/m³	Intervention limit value ILV in µg/m³
Benzene	4.6 µg/m³	2 µg/m³	10 µg/m³
Formaldehyde	19.5 µg/m³	30 µg/m³	100 µg/m³

**Table 4:** Adverse events September 2016.

	Epistaxis	ENT	Dermatology	Ophthalmology
Cases number	20	19	16	12
Patients number	19	16	16	12
Already seen				
In May-June	1	1	1	1

the infirmary with this type of “skin lesion” in our presence, including a papule, centered by a stitch point, surrounded by an erythematous reaction. Immediate allergy reactions are most often “extensive local reaction” with a papula that can reach 3 cm to 12 cm, can persist for more than 24 h. No medical consultation describes the type of skin lesion. The last day was devoted to analyzing the situation with the air quality engineer and construction, by taking air samples from all the buildings, on the sport fields, in the air conditioners. In the definitive conclusions, we did not find any VOC levels that could explain a toxic phenomenon. The clinical data at our disposal, although very inhomogeneous, allow us to conclude that the pathological elements found, real or felt, are quite superimposed on a population not affected by a toxic contact. The presence of VOC in the premises is the result of the installation of new elements that typically emit VOC, aggravating local air pollution, with the ventilated air in the premises already being “loaded” instead of “new”, the benzene concentration in outdoor air in the vicinity of the establishment was measured in July at 3.6 µg/m³ (Burgeap report, paragraph 7.4, page 65). Despite the ventilation system, the values of benzene inside the premises are recorded at 4.6 µg/m³. The 2012 Atmo Champagne-Ardenne study (France) reported the same conclusion for the school premises inaugurated in 2011 (Study of indoor air quality in schools in the Troyes city: Campaign 2012, Atmo France/Champagne-Ardenne Study) with formaldehyde levels at 30 µg/m³, three times the rate to be observed on January 01, 2023 (10 µg/m³), without closing classes. The reported values for formaldehyde in school spaces (19.5 µg/m³) meet the 2016 regulatory values. Analysis of the air sampling report from the LFIP shows that some values (Benzene) are above the recommended values, in some rooms (auditorium, Dojo), but none are close to the intervention limit values (Table 3).

Despite these results communicated as early as July 2016 and available online, it turns out that the doubt persisted in many parental homes, with a decrease in the number of registrations for the year 2016-2017 (817 registrants on 1/9/2016 for 950 on 1/9/2015). After discussion with the LFIP nurses, it was decided to continue this study prospectively, over a period of one month between September 01 and 30, 2016, after carrying out the work to “standardize” during the school vacation period. A data collection protocol comprising 4 categories of pathologies, Otorhinolaryngology (ENT: Ear, Nose and Throat) (Rhinitis, Rhinopharyngitis), Epistaxis, Ophthalmology

(conjunctivitis), Dermatology (skin examination, insect bites points search) was set up in order to have a real vision of clinical cases. These data were compared with data from the period May 10 to June 30 2016. During this period, 67 pathological events were seen in the infirmary (Table 4).

Epistaxis concerns, as in the May-June group, for 90% of children aged between 3 and 10 years (18 cases out of 20 including one traumatic case, direct shock), i.e. 3.7% vs. 5.3% in May-June, 28 cases out of 522 students ( $p=0.25$  ns) with mean temperature values lower by 3° but not statistically different ( $30.4^{\circ} \pm 3.7^{\circ}$ , extremes  $16^{\circ}/36^{\circ}$  in May-June vs.  $26.9 \pm 3.5$  extremes  $21^{\circ}/32^{\circ}$  in September)  $p=0.16$  ns. The prospective analysis of data for the 2016-2017 school year of the association air temperature and frequency of epistaxis can be superimposed on the results of the period May-June 2016. The other ENT consultations are twice a "stuffy nose", 15 times "sore throat" treated with the miracle pill with Chinese herbs called Golden Throat (three times for the same child 3 days in a row), and an unspecified symptomatology with parental call and back to class.

Concerning skin lesions, those noted in September clearly authenticate mosquito bites in 9 out of 16 cases, one case is an allergic reaction already seen in May-June after a "country trip" for the same symptoms (with medical consultation), a case is a gluteal abscess, 3 cases report only an unspecified "button" and 3 cases are recorded unspecified, in ophthalmology three cases are direct eye trauma, two cases do not specify a diagnosis, two cases for the same child are labeled conjunctivitis with medical consultation advice the other five cases are watery eyes, itchy eyes (including a child already seen in May-June). Apart from the structural modifications carried out during the summer which, probably, go beyond the standard of the recommendations, it is desirable to be concerned with the treatment of the wetlands located, between the running track and the soccer field and beyond the enclosure of the high school towards the expressway in order to avoid the larval proliferation of mosquitoes, the latter area also being a source of pollen release causing allergic manifestations in late spring.

## Conclusion

The initial diagnosis made in July, ruling out any correlation between the structures of the LFIP and the pathologies observed, is fully confirmed by the prospective observation of data for

the month of September. After consultation with the engineer responsible for the analysis of the air quality data, even if somewhat high levels of VOC/BTEX have been recorded, these are far below the toxicity and concentration thresholds intervention limits. The work carried out during the school holidays, with an auditorium still closed until February 2017, did not change anything in terms of pathologies observed, with even an increase in the number of daily pathological events to 2.23/day, these cases registered clinics are strictly superimposable to those described in the literature in a population not subjected to toxic contact. The use of social networks by the parents of pupils has led to a climate of unjustified suspicion, increased by Chinese cultural behavior of hyper-protectionism of the often single child (Sino-Caucasian couples), with as a consequence the setting in place of transformation works for nearly 333.000 Euros. Despite these maximum precautions, the LFIP lost around a hundred students at the start of the 2016-2017 school year (i.e. around 70,000 Euros in registration fees), excluding variation in expatriate flows for French companies. This study shows that the WeChat blog has had an impact on medical disinformation and has generated costly structural modifications to the LFIP, the merits of which are more than questionable. Maximum precautionary measures have, under pressure from families, supplanted scientific reasoning.

## References

1. Pedroletti B (Pékin correspondant): Le Monde, 15 June 2016. Le Lycée français de Pékin contaminé par des substances chimiques.
2. Reiss M, Reiss G. Epistaxis: Some aspects of laterality in 326 patients. *Eur Arch Otorhinolaryngol.* 2012;269(3):905-9.
3. Kamble P, Saxena S, Kumar S. Nasal bacterial colonization in cases of idiopathic epistaxis in children. *Int J Pediatr Otorhinolaryngol.* 2015;79(11):1901-4.
4. Jelavic B, Majstorovic Z, Kordić M, Leventić M, Grgić MV, Baudoin T. Idiopathic epistaxis and meteorological factors: Case-control study. *B-ENT.* 2015;11(4):267-73.
5. Szyszkowicz M, Shutt R, Kousha T, Rowe BH. Air pollution and emergency department visits for epistaxis. *Clin Otolaryngol.* 2014;39(6):345-51.