

Paris, September 12, 2018

Press information**One quarter of deaths and cases of serious after-effects related to meningitis in children can be avoided by applying the immunization schedule**

In a context of increasing vaccine hesitancy, researchers from Inserm and pediatricians from the Nantes and Grand-Ouest university hospitals together with the Paris public hospitals (AP-HP) sound the alarm concerning the consequences of severe bacterial infections in children. In a study published in [*Paediatric and Perinatal Epidemiology*](#), the researchers showed, over a period of 5 years, that 25 % of deaths and 25 % of serious after-effects occurring in children with a severe bacterial infection (primarily meningitis) could have been avoided by simply applying the immunization schedule, notably against meningococcus and pneumococcus.

Bacterial infections are common and for the most part efficiently dealt with by our natural defenses, with an occasional helping hand from antibiotics. Nevertheless, children –and more particularly babies– form a vulnerable population in the face of some severe bacterial infections (meningitis, purpura fulminans, septic shock, etc.) which can lead to serious after-effects (paralysis, sensory deficit –particularly hearing loss–, hydrocephalus, epilepsy, amputation) and even death. While vaccines against the principal bacteria responsible for these infections exist (meningococcal C and pneumococcal conjugate vaccines), defiance towards vaccination, a growing phenomenon in France, is leading to a lack of complete vaccination in some children, putting them at risk of serious after-effects or death.

That is why researchers from Inserm and pediatricians wished to determine, in children having contracted a severe bacterial infection, the proportion of those which could have been avoided had immunization taken place according to the official recommended schedule.

In France's Grand-Ouest administrative region, all children aged 1 month to 16 years admitted to pediatric intensive care for severe bacterial infection or who died prior to admission were prospectively included from 2009 to 2014 in a study coordinated by Inserm and funded by the Ministry of Health. An infection was considered theoretically preventable by vaccination if the child had either not been vaccinated or had been incompletely¹ vaccinated and that the bacterial strains identified in his or her body were targeted by the vaccines recommended at the time of infection onset.

¹“Incomplete vaccination” status was defined as the receipt of fewer injections than those recommended for the age of the child, with authorized delays of 15 days for the pneumococcal primary vaccination and 1 month for the pneumococcal booster and meningococcal C vaccination (according to Gras P, 2017)

According to the results of this study, meningococcus and pneumococcus were the principal bacteria causing severe infections in children (65 %), responsible for 71 % of the deaths and close to half of the cases of serious after-effects, despite the introduction of meningococcal C and pneumococcal conjugate vaccines to France's vaccine schedule in 2002 and 2009.

Only 39 % of the children were correctly vaccinated against these bacteria, meaning that 61 % had either been incompletely vaccinated or not at all. More important still, according to the Inserm study, 25 % of the deaths and 25 % of the cases of after-effects could have been prevented by complete and timely immunization according to the recommended schedule.

In France, while vaccination against the two principal bacteria responsible for these severe infections is now mandatory for all children born after January 1, 2018 (meningococcal C and pneumococcal conjugate vaccines), the majority of the deaths related to meningococcus C occurred in children over 2 years of age who had not had their catch-up vaccination. These children are not currently concerned by the obligation to get vaccinated, which is why it is fundamental to apply the current catch-up recommendations.

As such, according to the researchers, *"morbidity-mortality rates related to severe vaccine-preventable infections could be reduced by one quarter with better implementation of immunization programs in France. Such information could help enhance the perception of vaccine benefits and fight vaccine hesitancy"*.

Sources

Vaccine-preventable severe morbidity and mortality caused by meningococcus and pneumococcus: a population-based study in France

Fleur Lorton^{a,b,c}, Martin Chalumeau^{b,d}, Rémy Assathiany^e, Alain Martinot^f, Marie Bucchia^c, Jean-Michel Roué^g, Pierre Bourgoïn^h, Julie Chantreuilⁱ, Gérald Boussicault^j, Théophile Gaillot^k, Jean-Pascal Saulnier^l, Jocelyne Caillon^m, Corinne Levyⁿ, Robert Cohenn,^o Christèle Gras-Le Guen^{a,b,c}, Elise Launay^{b,c}

a Centre d'investigation clinique INSERM 1413, Femme Enfant Adolescent, CHU de Nantes, Nantes, France

b Inserm UMR 1153, Obstetrical, Perinatal and Pediatric Epidemiology Research Team (Epopé), Center for Epidemiology and Statistics Sorbonne Paris Cité (CRESS), Paris Descartes University, Paris, France

c Services d'urgences pédiatriques et de pédiatrie générale, Hôpital Femme Enfant Adolescent, CHU de Nantes, Nantes, France

d Department of General Pediatrics and Pediatric Infectious Diseases, Necker hospital for Sick Children; Assistance Publique-Hôpitaux de Paris; Paris Descartes University, Paris, France

e Association pour le Recherche et l'Enseignement en Pédiatrie Générale (AREPEGE); Association Française de Pédiatrie Ambulatoire (AFPA), Cabinet de Pédiatrie, Issy-les-Moulineaux, France

f Univ. Lille, EA2694, CHU Lille, F-59000 Lille, France

g Service de réanimation pédiatrique et néonatale, Hôpital Morvan, CHU de Brest, Brest France

h Service de réanimation pédiatrique et néonatale, Hôpital Femme Enfant Adolescent, CHU de Nantes, Nantes, France

i Service de réanimation pédiatrique et néonatale, Hôpital Clocheville, CHU de Tours, Tours, France

j Service de réanimation pédiatrique, CHU d'Angers, Angers, France

k Service de réanimation pédiatrique, Hôpital Sud, CHU de Rennes, Rennes, France
l Service de réanimation pédiatrique et néonatale, Tour Jean Bernard, CHU de Poitiers, Poitiers, France
m Laboratoire de microbiologie, Hôtel Dieu, CHU de Nantes, Nantes, France
n ACTIV, Association Clinique et Thérapeutique Infantile du Val de Marne, Saint-Maur des Fossés, France
o Centre Hospitalier Intercommunal de Créteil, Centre de Recherche Clinique, Créteil, France
FranceStudy funded by the Program for clinical research in hospitals) (DGOS, PHRC 2008 no. BRD 08- 06-T)

Paediatric and Perinatal Epidemiology

<https://doi.org/10.1111/ppe.12500>

Researcher contact

Elise Launay

Unit 1153 Center of Research in Epidemiology and Statistics Sorbonne Paris Cité (CRESS)
Inserm EPOPE team: Obstetrical, perinatal and pediatric epidemiology
+33 (0)1 42 34 55 71
elise.launay@chu-nantes.fr

Fleur Lorton

Unit 1153 Center of Research in Epidemiology and Statistics Sorbonne Paris Cité (CRESS)
Inserm EPOPE team: Obstetrical, perinatal and pediatric epidemiology
+33 (0)1 42 34 78 10
fleur.lorton@chu-nantes.fr

Press contact

presse@inserm.fr



Access the [Inserm press room](#)



Budget 908 M€	Budget € 908 M
Collaborateurs 13 296	Staff 13 296
Communiqués de presse 123	Press releases 123
Laboratoires 351	Laboratories 351
Publications scientifiques 13 220	Scientific publications 13 220